

IHMA PATENT NEWSLETTER

Limited circulation patent news bulletin for the Holography Industry

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Published and granted patents

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

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P37088

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

EP4269124

RUIZ QUEVEDO ANDRES (*Applicant & Inventor*)

Application Nber / Date: EP22382394 2022-04-26

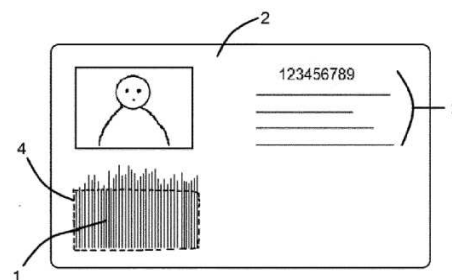
Priority Nber / Date / Country: EP22382394 2022-04-26

LENTICULAR ARRAY

Lenticular array (1) incorporated to a support (2) such as an identity card, having a dataset (3) unique to that support (2) where the lenticular array (1) is configured according to a method whereby microlens feature values (the microlens feature being, for instance, the length of the microlenses) are assigned to the characters of a digital code generated out of processing the dataset (3). In this way, the lenticular array (1) will be configured with microlenses of different length values, said configuration being unique to that lenticular array (1) and therefore to the support (2) to which said array (1) is incorporated. A method to verify the authenticity of the support (2) is aimed at detecting any manipulation of the dataset (3).

MATRICE LENTICULAIRE

Matrice lenticulaire (1) incorporée à un support (2) tel qu'un document d'identité, ce support (2) comprenant un ensemble de données (3) qui lui est propre, la matrice lenticulaire (1) étant conçue selon un procédé dans lequel les valeurs des caractéristiques des microlentilles (les caractéristiques des microlentilles, par exemple, la longueur des microlentilles) sont attribuées aux caractères d'un code numérique généré à partir du processus de l'ensemble de données (3). Ainsi, la matrice lenticulaire (1) est conçue avec des microlentilles de différentes valeurs de longueur, cette conception étant unique pour ladite matrice lenticulaire (1) et pour le support (2) dans lequel cette matrice (1) est incorporée. Un procédé pour vérifier l'authenticité du support (2) a pour objectif de détecter n'importe quelle manipulation de l'ensemble de données (3).



CLAIM 1. Lenticular array (1) incorporated to a support (2), the support (2) carrying a dataset (3) unique to it, characterized in that the configuration of the lenticular array (1) is related to the dataset (3).

Equivalents : WO2023/209257A1

Status: Pending

EP 4 269 124 A1

Research Report:



EUROPEAN SEARCH REPORT

Application Number
EP 22 38 2394

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	DE 10 2004 062922 A1 (AUSTRIA CARD [AT]) 6 July 2006 (2006-07-06)	1-4, 11	INV. B42D25/324
Y	* paragraph [0012] - paragraph [0066];	4	B42D25/342
A	claims 1-18; figures 1-3 *	5-10, 12-17	B42D25/305 B42D25/23 B42D25/425
Y, D	EP 2 927 881 A1 (GEMALTO SA [FR]) 7 October 2015 (2015-10-07)	4	B42D25/485 G06K7/00 G07D7/12 H04L9/00
A	DE 10 2013 022028 A1 (GIESECKE & DEVRIENT GMBH [DE]) 25 June 2015 (2015-06-25)	1-17	
A	* paragraph [0006] - paragraph [0065]; claims 1-18; figures 1-2 *	1-17	
A	US 2019/070887 A1 (PETERS JOHN ANTHONY [CH] ET AL) 7 March 2019 (2019-03-07)	1-17	
	* paragraph [0007] - paragraph [0127]; claims 1-37; figures 1-8 *		
			TECHNICAL FIELDS SEARCHED (IPC)
			B42D G06K G07D H04L

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

P37047

CARD

WO2023214546

Priority Date: 02/05/2022

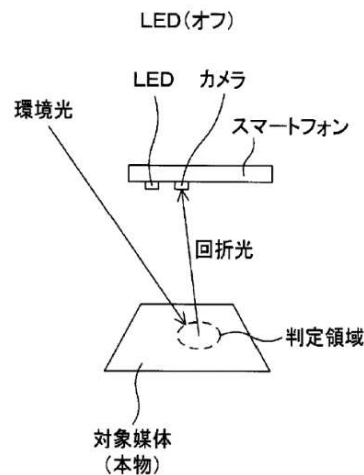
DAI NIPPON PRINTING

COMPUTER PROGRAM, AUTHENTICITY DETERMINATION DEVICE, AND AUTHENTICITY DETERMINATION METHOD

Provided are a computer program, an authenticity determination device, and an authenticity determination method with which it is possible to determine the authenticity of a medium without special skills or expertise. The computer program causes a computer to execute: acquiring a first image obtained by photographing an object medium under a first photographing condition and a second image obtained by photographing under a second photographing condition; generating a difference image on the basis of the acquired first and second images; extracting a feature amount based on a pixel value of the generated difference image; and determining the authenticity of the object medium on the basis of the extracted feature amount.

PROGRAMME INFORMATIQUE, DISPOSITIF DE DÉTERMINATION D'AUTHENTICITÉ ET PROCÉDÉ DE DÉTERMINATION D'AUTHENTICITÉ

L'invention concerne un programme informatique, un dispositif de détermination d'authenticité et un procédé de détermination d'authenticité qui permettent de déterminer l'authenticité d'un support sans compétences ni expertise spéciales. Le programme informatique amène un ordinateur à : acquérir une première image obtenue par photographie d'un support d'objet dans une première condition de photographie et une seconde image obtenue par photographie dans une seconde condition de photographie ; générer une image de différence d'après les première et seconde images acquises ; extraire une quantité de caractéristiques d'après une valeur de pixel de l'image de différence générée ; et déterminer l'authenticité du support d'objet d'après la quantité de caractéristiques extraite.



CLAIM 1. Provided is a computer program that causes a computer to execute processing that: acquires a first image of a target medium taken under a first imaging condition and a second image taken under a second imaging condition; generates a differential image on the basis of the acquired first image and second image; extracts a feature value on the basis of the pixel value of the generated differential image; and determines the authenticity of the target medium on the basis of the extracted feature value.

P37096

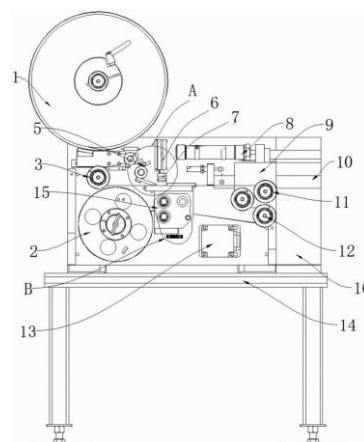
CN220011605U

Priority Date: 16/06/2023

JIANGSU ZHENXIANG ANTI COUNTERFEITING TECHNOLOGY

TRANSPARENT LASER HOLOGRAPHIC ANTI-FAKE FILM ELECTROSTATIC PATTERN ELIMINATING DEVICE

The utility model discloses a transparent laser holographic anti-counterfeiting film static line eliminating device which comprises an unreeling wheel, a reeling wheel, a rotary driving piece and a bracket, wherein a main body is fixed at the top of the bracket, a supporting rod is fixed at the front part of the main body, a leveling piece is movably arranged on the supporting rod, a fastening bolt is screwed on the leveling piece, one end of the fastening bolt penetrates through the leveling piece and is screwed on the supporting rod, a first telescopic driving piece is fixed at one side, close to the supporting rod, of the main body through the bolt, and the output end of the first telescopic driving piece is connected with an upper static eliminator. According to the anti-counterfeiting film, the smoothing piece rotates on the supporting rod through rotating the fastening bolt, one end of the smoothing piece is pressed on the anti-counterfeiting film, and when the anti-counterfeiting film moves, the smoothing piece can smooth the anti-counterfeiting film, so that the quality of the anti-counterfeiting film is improved.



CLAIM 1. The utility model provides a transparent laser holographic anti-fake membrane static line remove device which characterized in that: including unreeling wheel (1), reel (2), rotary driving spare (13) and support (14), the top of support (14) is fixed with host computer body (16), the front portion of host computer body (16) is fixed with bracing piece (22), the activity is provided with on bracing piece (22) and smooths piece (4), it has fastening bolt (5) to smooth to revolve on piece (4), the one end of fastening bolt (5) passes smooths piece (4) and revolves to bracing piece (22), one side that host computer body (16) is close to bracing piece (22) is through bolt fastening has first flexible driving piece (6), the output of first flexible driving piece (6) is connected with static eliminator (7).

P37097

LABEL

CN220009181U

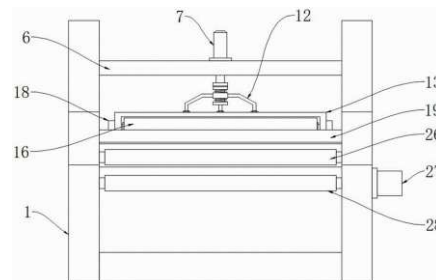
Priority Date: 28/04/2023

JIANGSU ZHENXIANG ANTI COUNTERFEITING TECHNOLOGY

LASER HOLOGRAPHIC ANTI-FAKE LABEL LAMINATING DEVICE

The utility model discloses a laser holographic anti-counterfeiting label laminating device which comprises a frame and a fixed plate, wherein a telescopic component is fixed at the center of the upper end face of the fixed plate, a telescopic rod is arranged at the output end of the telescopic component, a fixed block is arranged outside the telescopic rod, a pressure sensor is arranged on the lower end face of the fixed block, a mounting sleeve is arranged outside the bottom end of the telescopic rod, and a mounting rod is arranged outside the mounting sleeve. According to the utility model, the pressure sensor is arranged on the lower end surface of the fixed block, when the press roller frame drives the press roller to process the lamination of the printed matter, the press roller frame drives the installation sleeve to longitudinally move through the installation rod, so that the installation sleeve drives the push plate through the spring, then the push plate presses the pressure sensor, and when the pressure sensor bears excessive or insufficient pressure, the telescopic component drives the installation sleeve through the telescopic rod to adjust, so that the press roller is always in a reasonable pressure range, the problem that the lamination device cannot control the pressure of the press roller is solved, and further the product quality is improved.

CLAIM 1. The utility model provides a laser holography antifalsification label tectorial membrane device, includes frame (1) and fixed plate (6), its characterized in that: the utility model discloses a telescopic device for the high-speed hydraulic pressure machine, including fixed plate (6), telescopic subassembly (7) and spring (14), fixed plate (8) are fixed in the center department of fixed plate (6) up end, the output of telescopic subassembly (7) is provided with telescopic link (8), the outside of telescopic link (8) is provided with fixed block (9), the lower terminal surface of fixed block (9) is provided with pressure sensor (10), just the outside of telescopic link (8) bottom is provided with installation cover (11), the outside of installation cover (11) is provided with installation pole (12), the bottom of installation pole (12) is provided with pressure roller frame (13), just the both ends of installation cover (11) are provided with spring (14), the both ends of spring (14) are provided with push pedal (15).



P37102

PRINTING – LABEL

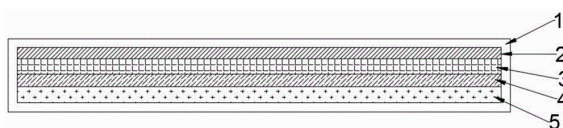
CN219979037U

Priority Date: 08/02/2023

WUXI NEW LIGHT IMPRESSION PREVENTING FAISE TECHNIQUE

WATERPROOF ANTI-COUNTERFEITING LABEL

The utility model discloses a waterproof anti-counterfeiting label which comprises a waterproof membrane main body, wherein an aluminized layer, a holographic printing layer, a reinforcing layer and an anti-counterfeiting code printing layer are sequentially coated and pressed in the waterproof membrane main body from top to bottom, the waterproof membrane main body adopts a nano waterproof membrane, and the holographic layer adopts a nano microstructure holographic layer. Through setting up the waterproof membrane main part that adopts nanometer waterproof membrane, wrap up anti-fake label for anti-fake label has the water-proof effects, through setting up anti-fake code printing layer, the user both can distinguish true and false through distinguishing holographic layer printed special pattern, can tear the label simultaneously and look over anti-fake code that anti-fake code printing layer printed and distinguish true and false, because the label adopts nanometer waterproof membrane and nanometer microstructure holographic layer, can not carry out the secondary after tearing.



CLAIM 1. The waterproof anti-counterfeiting label is characterized by comprising a waterproof film main body, wherein an aluminized layer, a holographic printing layer, a reinforcing layer and an anti-counterfeiting code printing layer are sequentially coated and pressed inside the waterproof film main body from top to bottom, the waterproof film main body adopts a nanometer waterproof film, and the holographic printing layer adopts a nanometer microstructure holographic layer.

P37103

PRINTING – LABEL

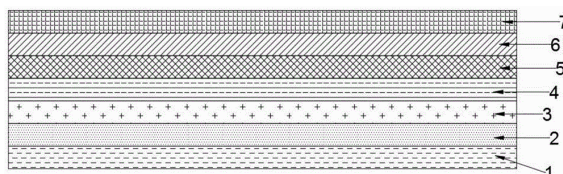
CN219979036U

Priority Date: 01/02/2023

WUXI NEW LIGHT IMPRESSION PREVENTING FAISE TECHNIQUE

SCRATCH-RESISTANT COATING LABEL STRUCTURE CAPABLE OF IDENTIFYING ANTI-COUNTERFEITING INFORMATION

The utility model discloses a scratch-resistant coating label structure capable of identifying anti-counterfeiting information, which is formed by sequentially laminating a bottom paper layer, a silicon oil layer, a glue layer, a paper layer, an intelligent code layer, a gloss oil layer and a scratch-resistant coating layer from inside to outside. The laser holographic anti-counterfeiting silver scraping layer is used as a scratch-resistant coating, so that the imitation cost of the laser holographic anti-counterfeiting is high, the imitation difficulty is high, and the anti-counterfeiting effect is improved; the intelligent code which can be identified by a machine is printed in the scratch-off coating, so that the anti-counterfeiting effect is further improved.



CLAIM 1. The utility model provides a but identification anti-fake information's doctor-blading layer label structure, but anti-fake label is by interior and outside cover in proper order base paper layer (1), silicone oil layer (2), glue layer (3), ply (4), intelligence sign indicating number layer (5), gloss oil layer (6) and can scrape coating (7) the combination form, a serial communication port, intelligence sign indicating number layer (5) are adopt digital printer printing to form on coated paper, can use machine identification, but scrape coating (7) adopt the holographic anti-fake silver layer of scraping of laser.

P37132

CN116968462

Priority Date: 21/08/2023

WUHAN HUAGONG IMAGE TECHNOLOGY & DEVELOPMENT

ANTI-PLATE-TURNOVER HOLOGRAPHIC ELECTROCHEMICAL ALUMINUM AND PREPARATION METHOD THEREOF

The invention discloses anti-roll-over holographic alumite, which at least comprises a base film layer, a release layer, an aluminum silver paste ink imaging layer and an adhesive layer which are sequentially arranged; the aluminum paste ink imaging layer comprises the following raw materials in parts by mass: 20-35 parts of thermoplastic acrylic resin, 10-15 parts of aluminum paste, 55-65 parts of solvent and 0-0.5 part of auxiliary agent. The invention also discloses a preparation method of the anti-roll-over holographic electrochemical aluminum, which comprises the following steps: coating a release layer on the base film layer; coating an aluminum silver paste ink imaging layer on the release layer; molding a holographic pattern on the aluminum silver paste ink imaging layer; curing after the mould pressing is finished; and coating a glue layer on the cured aluminum paste ink imaging layer. According to the invention, because the metal aluminum and the thermoplastic acrylic resin are simultaneously present in the imaging layer, when the pattern is to be reproduced by means of alkali liquor washing, the imaging layer pattern can be destroyed while the aluminum and the alkali liquor are subjected to chemical reaction, so that the original holographic pattern is incomplete, the original holographic pattern cannot be reproduced, and the anti-reproduction effect is achieved.



CLAIM 1. An anti-roll-over holographic alumite is characterized by at least comprising a base film layer, a release layer, an aluminum silver paste ink imaging layer and an adhesive layer which are sequentially arranged; the aluminum paste ink imaging layer comprises the following raw materials in parts by mass: 20-35 parts of thermoplastic acrylic resin, 10-15 parts of aluminum paste, 55-65 parts of solvent and 0-0.5 part of auxiliary agent.

P37138

PRINTING – BANKNOTE – LABEL – BRAND PROTECTION

CN116945786

Priority Date: 03/08/2023

ZHANG JIANFA

MANUFACTURING METHOD OF DIRECT-WRITING VARIABLE LASER HOLOGRAPHIC SERIAL NUMBER

The invention provides a manufacturing method of a direct-writing type variable laser holographic serial number, and relates to the field of variable laser holographic serial numbers. The method comprises a manufacturing method of a variable laser holographic serial number. The invention directly processes the film of the moldable laser holographic image such as the molded laser label electrochemical aluminum film, the transparent dielectric film or the packaging film, and the like, and prepares variable laser holographic serial numbers in batches, wherein the laser holographic serial numbers can be used in a plurality of fields such as laser holographic anti-counterfeit labels, card films, banknote printing anti-counterfeit, laser packaging and the like, products in each field have a special variable laser holographic number or pattern, the anti-counterfeit performance of the products can be effectively improved, and only one laser holographic master is needed to prepare the variable laser holographic serial numbers or laser holographic characters, patterns, letters and the like in a printing or hand-drawing carving mode and the like, without singly preparing a huge amount of laser holographic masters for some contents needing to be changed, and the preparation cost and time are greatly reduced.

CLAIM 1. The manufacturing method of the direct-writing type variable laser holographic serial number comprises the manufacturing method of the variable laser holographic serial number and is characterized in that: the manufacturing method of the variable laser holographic serial number comprises two methods: the method comprises the following steps: a printing method for manufacturing a variable laser holographic serial number in a dot matrix mode; the second method is as follows: a method for manufacturing variable laser holographic serial number carving by a hand-painting mode.

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

P37043

PRINTING – BANKNOTE – CARD – RELIEF

WO2023222156

Priority Date: 18/05/2022

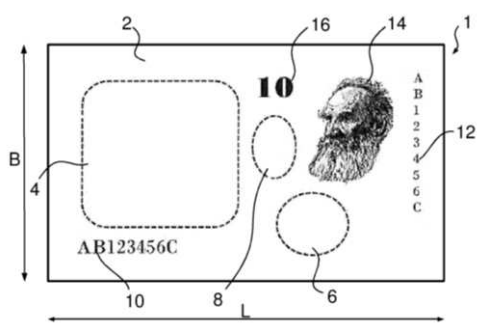
GIESECKE & DEVRIENT CURRENCY TECHNOLOGY

VALUE DOCUMENT, AND METHOD FOR PRODUCING A VALUE DOCUMENT

The invention relates to a value document (1), such as a bank note, a cheque, a credit card or other payment card, an identity card or the like, which has a front side and a rear side. The value document (1) features, when looked through, a first transparent image that is visible to the unaided eye and has specific dimensions (L, B) when viewed from above. The value document (1) has a substrate body (2) which, when viewed from above, has the specific dimensions (L, B) and is connected to a first transparent film (18), which has an inner side and an outer side, in such a way that the substrate body (2) bears against the inner side of the first transparent film (18) so that the substrate body (2) faces the rear side and the outer side of the first transparent film (18) faces the front side. The first transparent film (18) also has the specific dimensions (L, B) when viewed from above, and the first transparent image that is visible when looked through is produced by a first metallised and/or printed structure which is located on the inner side of the first transparent film (18). The first metallised and/or printed structure is covered with a translucent colour layer.

DOCUMENT DE VALEUR ET PROCÉDÉ DE FABRICATION D'UN DOCUMENT DE VALEUR

L'invention concerne un document de valeur (1), tel qu'un billet de banque, un chèque, une carte de crédit ou une autre carte de paiement, une carte d'identité ou similaire, qui présente un recto et un verso. Le document de valeur (1) présente, lorsqu'il est observé, une première image transparente qui est visible à l'œil nu et présente des dimensions spécifiques (L, B) lorsqu'elle est vue depuis le dessus. Le document de valeur (1) a un corps de substrat (2) qui, vu de dessus, présente les dimensions spécifiques (L, B) et est relié à un premier film transparent (18), qui a un côté interne et un côté externe, de sorte que le corps de substrat (2) s'appuie contre le côté interne du premier film transparent (18) de sorte que le corps de substrat (2) fasse face au verso et le côté externe du premier film transparent (18) fasse face au recto. Le premier film transparent (18) présente également les dimensions spécifiques (L, B) lorsqu'il est vu de dessus, et la première image transparente qui est visible lorsqu'elle est observée est produite par une première structure métallisée et/ou imprimée qui est située sur le côté interne du premier film transparent (18). La première structure métallisée et/ou imprimée est recouverte d'une couche de couleur translucide.



CLAIM 1. A document of value, such as a bank note, a check, a credit or other payment card, an identity card or the like, which has a front and a rear side, shows a first transparent image recognizable to the naked eye in transparent form, has specific dimensions (L, B) in plan view, and has a substrate body (2) which has the specific dimensions (L, B) in plan view and is connected to a first transparent film (18) which has an inner side and an outer side, in such a way that the substrate body (2) bears against the inner side of the first transparent film (18), so that the substrate body (2) points towards the rear side and the outer side of the first transparent film (18) points towards the front side, the first transparent film (18) also having the specific dimensions (L, B) in plan view, and the first transparent image being produced by a first metallized and/or printed structure which is arranged on the inner side of the first transparent film (18), *d a u r c h e n z e i c h n e t* that the first metallized and/or printed structure is covered with a glazing color layer.

P37059

CARD – RELIEF – PERFORATIONS

WO2023208429

IDEMIA

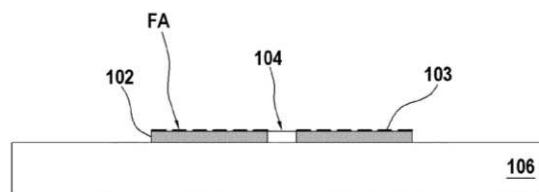
Priority Date: 27/04/2022

SECURITY DOCUMENT THAT CAN BE USED TO VIEW AN IMAGE COMPRISING A PLASMONIC FILM WITH PERFORATIONS

The invention relates to a security document that can be used to view an image comprising a plasmonic film (102) having a first face (FA) visible within the document, which first face has a plasmonic effect with a nanotextured surface (103), and a pattern comprising perforations (104) in the plasmonic film, the pattern defining the image that is seen when the security document is illuminated.

DOCUMENT DE SÉCURITÉ UTILISABLE POUR VISUALISER UNE IMAGE COMPRENANT UN FILM PLASMONIQUE AVEC DES PERFORATIONS

Document de sécurité utilisable pour visualiser une image, comprenant un film plasmonique (102) comprenant une première face (FA) visible au sein du document et présentant un effet plasmonique sur la première face, avec une surface nano-texturée (103), et un motif comprenant des perforations (104) du film plasmonique, le motif définissant l'image qui est visualisée lorsque le document de sécurité est éclairé.



CLAIM 1. A security document for use in displaying an image, comprising a plasmonic film comprising a first face visible within the document and having a plasmonic effect on the first face, and a pattern comprising perforations of the plasmonic film, the pattern defining the image which is displayed when the security document is illuminated.

P37068

KR102597533

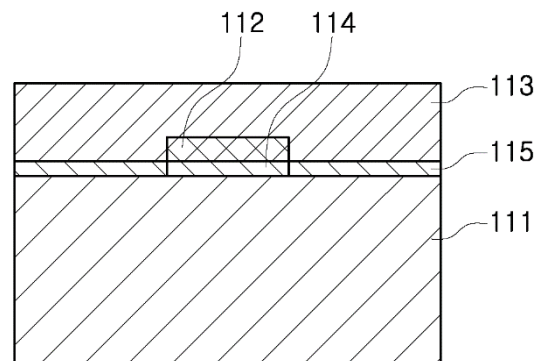
NBST

Priority Date: 01/07/2022

FORGERY PREVENTION MEANS FOR PREVENTING DELAMINATION AND FORGERY AUTHENTICATION METHOD USING SAME

The present invention relates to a forgery prevention means for preventing delamination and, more specifically, to a forgery prevention means capable of preventing delamination between layers stacked in a forgery prevention device through a structural color expressed by a load and an image formed by the structural color.

CLAIM 1. An anti-forgery means comprising: a first layer formed of a flexible material and including a high wrinkle area and a low wrinkle area; a second layer patterned on an upper portion of the high wrinkle area, formed of a material having a Young's modulus greater than that of the first layer, and adhered to the first layer; a third layer adhered to cover the low wrinkle area and the second layer, and formed of a material having a Young's modulus greater than that of the first layer and less than that of the second layer; and an adhesive layer adhering the first layer, the second layer, and the third layer, wherein elastic coefficients and thicknesses of the first layer, the second layer, the third layer, and the adhesive layer satisfy the following equation. (where X_i is a distance from an outer surface of the first layer to central surfaces of thicknesses of the second layer and the third layer and the adhesive layer, d_n is a distance from an outer surface of the first layer to a neutral plane, ϵY_i is an elastic strain limit of the first layer, the second layer and the third layer, and the adhesive layer, and r is a radius of curvature of the anti-forgery means)



P37081

CARD

EP4279292

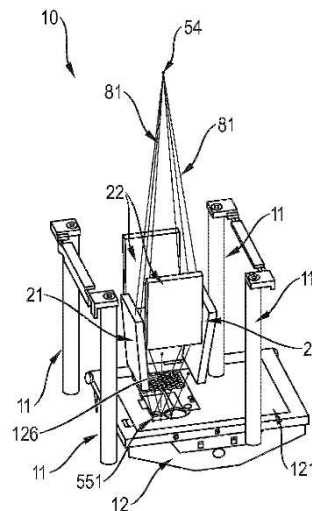
MB AUTOMATION

Priority Date: 19/05/2022

DOCUMENT PROCESSING APPARATUS

The invention relates to a device for processing documents (document processing system (10)), especially security documents. The document processing system (10) according to the invention has at least one document carrier device (12) with a document receiver (121), configured to receive and transport a document (51) to be processed, and a document processing device, configured to process the document (51) in a specific processing region (82), wherein the document carrier device (12) is designed to move the document (51) in two spatial directions.

CLAIM 1. Document processing system (10), in particular for processing security documents, comprising: at least one document support device (12) with a document receiver (121) configured to receive and transport a document (51) to be processed, a document processing device configured to process the document (51) in a specific processing area (82); The document support device (12) is designed to move the document (51) in two spatial directions within the document processing system (10).



P37085

BANKNOTE – RELIEF – MOTH’S EYE STRUCTURE

EP4275912

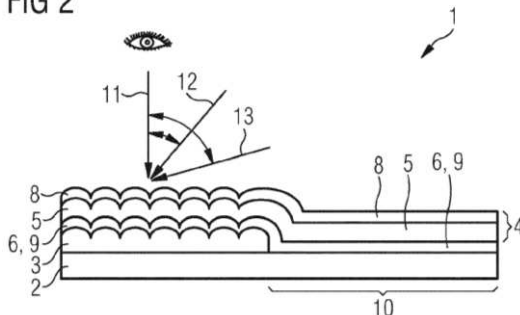
HUECK FOLIEN

Priority Date: 10/05/2022

SAFETY ELEMENT

The present invention relates to a security element (1) having optical security features, suitable for arrangement on a planar support (2), comprising a moth's eye structure (3) and a layer for producing a first color shift effect (4), wherein the security element further has a reflective layer (6), which reflective layer (6) is arranged at least in sections directly on the moth's eye structure (3), and the layer for producing a first color shift effect (4) is arranged at least in sections overlapping the reflective layer (6) arranged on the moth's eye structure (3), and wherein the layer for producing a first color shift effect (4) is a thin-film arrangement, comprising at least one dielectric layer (5) arranged on the reflective layer (6) as a spacer layer and an absorber layer (8) arranged on the dielectric layer.

FIG 2



CLAIM 1. A security element (1) with optical security features, suitable for arrangement on a flat support (2), comprising a moth-eye structure (3) and a layer for producing a first color-tilting effect (4), characterized in that The security element further comprises a reflective layer (6), said reflective layer (6) being arranged directly on the moth eye structure (3) at least in sections, and the layer being arranged so as to overlap the reflective layer (6) arranged on the moth eye structure (3) at least in sections in order to produce a first color shift effect (4), and The layer for producing a first color shift effect (4) is a thin-film arrangement comprising at least one dielectric layer (5) arranged on the reflective layer (6) as a spacer layer and an absorber layer (8) arranged on the dielectric layer.

P37086

BANKNOTE – RELIEF – MOTH’S EYE STRUCTURE

EP4275911

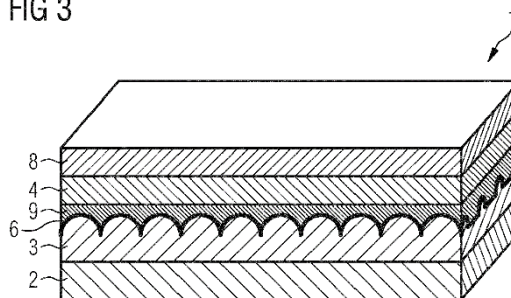
HUECK FOLIEN

Priority Date: 10/05/2022

SAFETY ELEMENT

The present invention relates to a security element (1) having optical security features, suitable for arrangement on a flat support (2), comprising a moth's eye structure (3) and a layer for producing a first color shift effect (4), wherein the security element further has a reflective layer (6), which reflective layer (6) is arranged at least in sections directly on the moth's eye structure (3), and the layer for producing a first color shift effect (4) is arranged at least in sections so as to overlap the reflective layer (6) arranged on the moth's eye structure (3).

FIG 3



CLAIM 1. A security element (1) with optical security features, suitable for arrangement on a flat support (2), comprising a moth-eye structure (3) and a layer for producing a first color-tilting effect (4), characterized in that the security element further comprises a reflective layer (6), which reflective layer (6) is arranged at least in sections directly on the moth-eye structure (3), and the layer for producing a first color-tilting effect (4) is arranged at least in sections so as to overlap the reflective layer (6) arranged on the moth-eye structure (3).

P37088

**PATENT OF THE MONTH
PRINTING – CARD – RELIEF – MICROLENS**

EP4269124

RUIZ QUEVEDO ANDRES

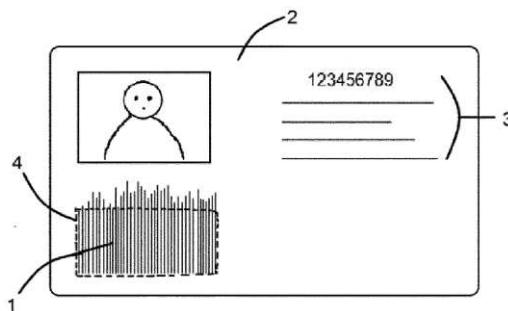
Priority Date: 26/04/2022

LENTICULAR ARRAY

Lenticular array (1) incorporated to a support (2) such as an identity card, having a dataset (3) unique to that support (2) where the lenticular array (1) is configured according to a method whereby microlens feature values (the microlens feature being, for instance, the length of the microlenses) are assigned to the characters of a digital code generated out of processing the dataset (3). In this way, the lenticular array (1) will be configured with microlenses of different length values, said configuration being unique to that lenticular array (1) and therefore to the support (2) to which said array (1) is incorporated. A method to verify the authenticity of the support (2) is aimed at detecting any manipulation of the dataset (3).

MATRICE LENTICULAIRE

Matrice lenticulaire (1) incorporée à un support (2) tel qu'un document d'identité, ce support (2) comprenant un ensemble de données (3) qui lui est propre, la matrice lenticulaire (1) étant conçue selon un procédé dans lequel les valeurs des caractéristiques des microlentilles (les caractéristiques des microlentilles, par exemple, la longueur des microlentilles) sont attribuées aux caractères d'un code numérique généré à partir du processus de l'ensemble de données (3). Ainsi, la matrice lenticulaire (1) est conçue avec des microlentilles de différentes valeurs de longueur, cette conception étant unique pour ladite matrice lenticulaire (1) et pour le support (2) dans lequel cette matrice (1) est incorporée. Un procédé pour vérifier l'authenticité du support (2) a pour objectif de détecter n'importe quelle manipulation de l'ensemble de données (3).



CLAIM 1. Lenticular array (1) incorporated to a support (2), the support (2) carrying a dataset (3) unique to it, characterized in that the configuration of the lenticular array (1) is related to the dataset (3).

P37089

PRINTING – CARD – PASSPORT – RELIEF

EP4269123

THALES DIS

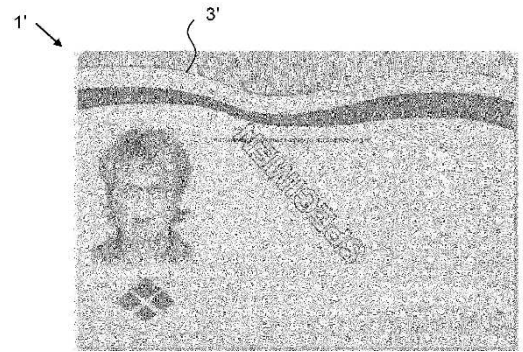
Priority Date: 29/04/2022

SECURITY ELEMENT WITH COLORSHIFT

A data carrier (1) for a secure article such as a passport comprises a carrier body (2), and at least one security element (3) being provided on the carrier body (2). The security element (3) comprises at least one surface structure extending along at least one extension direction (E) and at least one print (5) being at least partially arranged on the surface structure. The security element (3), in the region of the surface structure, is configured to exhibit different appearances when being observed under different viewing angles.

ÉLÉMENT DE SÉCURITÉ À COULEUR VARIABLE

La présente invention concerne un support de données (1) pour un article sécurisé tel qu'un passeport, qui comprend un corps de support (2) et au moins un élément de sécurité (3) présent sur le corps de support (2). L'élément de sécurité (3) comprend au moins une structure de surface s'étendant le long d'au moins un sens d'extension (E) et au moins une impression (5) étant au moins partiellement située sur la structure de surface. L'élément de sécurité (3), dans la zone de la structure de surface, est conçu pour présenter différents aspects lorsqu'il est observé sous différents angles de vue.



CLAIM 1. A data carrier (1) for a secure article such as a passport comprising: - a carrier body (2); and - at least one security element (3) being provided on the carrier body (2); characterized in that the security element (3) comprises at least one surface structure (4) extending along at least one extension direction (E) and at least one print (5) such as an inkjet print being at least partially arranged on the surface structure (4), wherein the security element (3), in the region of the surface structure (4), is configured to exhibit different appearances (A1; A2) when being observed under different viewing angles ($\alpha 1$; $\alpha 2$).

P37092

CARD – RELIEF – MICROLENS

CN220053321U

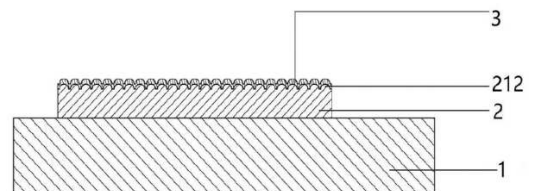
SHANGHAI GUANZHONG OPTICAL TECHNOLOGY

Priority Date: 30/05/2023

TRANSPARENT WINDOW FILM FOR ANTI-FAKE CERTIFICATE AND ANTI-FAKE CERTIFICATE CARD

The utility model discloses a transparent window film and an anti-counterfeiting card for an anti-counterfeiting certificate, wherein the transparent window film is fixedly arranged on the anti-counterfeiting certificate and comprises a substrate layer, a resin layer and a light reflecting layer from bottom to top; the resin layer is arranged on one side of the substrate layer, and the surface of the resin layer far away from the substrate layer is provided with a concave-convex structure; the light reflection layer is arranged on one side of the concave-convex structure away from the base material, the light reflection layer at least covers part of the concave-convex structure, the light reflection layer is provided with an engraving area for laser engraving, the engraving area is engraved by laser, the surface of the light reflection layer is enabled to display first area information, the area which is not the engraving area is enabled to display second area information matched with the first area information, the transparent window film can effectively improve the anti-counterfeiting grade of a certificate, and the concave-convex structure can prevent loss of laser energy, so that the laser engraving effect is better.

CLAIM 1. A transparent window film for an anti-counterfeiting document, the transparent window film being fixedly secured to the anti-counterfeiting document, the transparent window film comprising, from bottom to top: a substrate layer; the resin layer is arranged on one side of the substrate layer, and the surface of the resin layer far away from the substrate layer is provided with a concave-convex structure; the light reflection layer is arranged on one side, far away from the base material, of the concave-convex structure, and at least part of the concave-convex structure is covered by the light reflection layer, an engraving area used for laser engraving is arranged on the light reflection layer, and after the engraving area is engraved by the laser, first area information is displayed on the surface of the light reflection layer, and second area information matched with the first area information is displayed on an area which is not the engraving area.



P37130

LUMINESCENCE

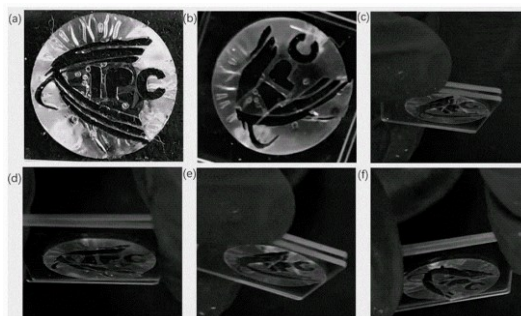
CN116970384

Priority Date: 22/04/2022

TECHNICAL INSTITUTE OF PHYSICS & CHEMISTRY – CHINESE ACADEMY OF SCIENCES

PHOSPHORESCENT DYE AND TRIPLE ANTI-COUNTERFEITING PHOTONIC CRYSTAL FILM CONTAINING PHOSPHORESCENT DYE, AND PREPARATION AND APPLICATION THEREOF

The invention discloses a phosphorescent dye and a triple anti-counterfeiting photonic crystal film containing the phosphorescent dye, and preparation and application thereof. The photonic crystal film contains a component of a novel phosphorescent dye, and is endowed with phosphorescent luminous anti-counterfeiting characteristics and phosphorescent luminous anti-counterfeiting characteristics with long service life, and the photonic crystal film has the structural color anti-counterfeiting characteristics of the photonic crystal, so that the photonic crystal film has triple anti-counterfeiting characteristics, the problems that the existing anti-counterfeiting technology is easy to forge, anti-counterfeiting equipment is complex, the anti-counterfeiting mode is single and the like are effectively solved, and the prepared anti-counterfeiting pattern is simple and easy to identify and has strong anti-counterfeiting specificity.



CLAIM 1. A phosphorescent dye, which is characterized in that the component of the phosphorescent dye is a compound shown in a formula I; wherein the R is 1 -R 3 Each independently selected from one of hydrogen, hydroxy, methoxy or aldehyde groups, R 1 -R 3 The same or different.

P37131

CN116968465

Priority Date: 21/07/2023

NINGBO INSTITUTE OF MATERIALS TECHNOLOGY & ENGINEERING - CHINESE ACADEMY OF SCIENCES | QIANWAN INSTITUTE OF CNITECH

CHARACTERISTIC INFORMATION CARRIER WITH MULTILAYER STRUCTURE, METHOD FOR PRODUCING THE SAME AND USE THEREOF

The application discloses a characteristic information carrier with a multilayer structure, a preparation method and application thereof. The characteristic information carrier comprises an optical characteristic layer arranged on the surface layer and a chemical characteristic layer arranged on the inner layer; the optical characteristic layer has a periodic micro-nano structure and can generate structural color; the chemical feature layer has a localized metallic element distribution such that the kind and/or content of metallic elements of different parts of the feature information carrier are different. The characteristic information carrier provided by the application has a visual structural color and can provide a first anti-counterfeiting function; by setting the structural color areas with different patterns, a second anti-counterfeiting function can be provided; the third anti-counterfeiting function can be realized by making the distribution of metal elements of different parts of the characteristic information carrier different; the distribution mode of the metal elements and the fine pattern structure are difficult to reversely detect, so that the imitation difficulty is greatly improved, and the anti-counterfeiting capacity is remarkably enhanced.



CLAIM 1. A characteristic information carrier having a multilayer structure, characterized in that the characteristic information carrier is lamellar, comprising optical characteristic layers and chemical characteristic layers arranged in a stack, the optical characteristic layers being located at the outermost layer, the chemical characteristic layers being located at an inner layer which is covered and protected by the optical characteristic layers; the surface of the optical characteristic layer is provided with a periodic micro-nano structure, and the periodic micro-nano structure is used for generating structural colors; the chemical feature layer has a localized metallic element distribution such that the different portions of the feature information carrier differ in the type and/or content of metallic elements.

Click on the title to return to table of contents

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

N9791

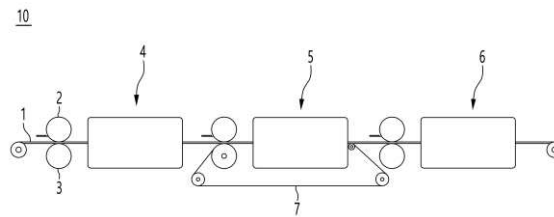
KR20230149955

Priority Date: 21/04/2022

I-TECH

MANUFACTURING METHOD, MANUFACTURING APPARATUS, AND REFLECTIVE FABRIC FOR PRODUCING HOLOGRAM EFFECT

The manufacturing method of a reflective fabric capable of producing a hologram effect of the present invention comprises: a step of applying an adhesive to an inlet on a conveyor belt; a bead application step; a beating step; a hot air drying step; and a pressing step. In addition, the reflective fabric manufactured by the method for manufacturing a reflective fabric capable of producing a hologram effect comprises: a substrate layer; and an adhesive applied to the substrate layer. A background member layer attached to the adhesive, a bead layer coated on the adhesive, the adhesive coated on the bead layer, and a polystyrene bead layer coated on the adhesive are stacked. The apparatus for manufacturing a reflective fabric capable of producing a hologram of the present invention enables a sheet having severe twist and bending to be fed smoothly.



CLAIM 1. A method of manufacturing a reflective fabric capable of producing a hologram effect, the method comprising: applying an adhesive to an inlet on a conveyor belt; applying beads; beating; drying hot air; and pressing.

Click on the title to return to table of contents

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

N9803

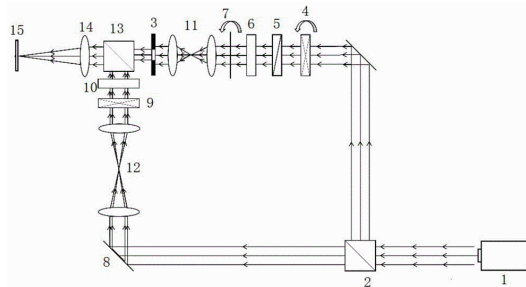
CN219958080U

Priority Date: 01/06/2023

FUJIAN NORMAL UNIVERSITY

SCALAR VORTEX BEAM GENERATION SYSTEM FOR COAXIAL TRADITIONAL OR POLARIZATION HOLOGRAPHY

The utility model relates to an on-axis conventional or polarized holography scalar vortex beam generating system, comprising: a laser light source; a polarization beam splitter for dividing laser generated by the laser light source into reference light and signal light; a reference light path; a signal light path; the signal light path is sequentially provided with an adjusting system and a first diaphragm, wherein the adjusting system comprises a first half wave plate, a quarter wave plate, a first polaroid, a fan-shaped slit, a first steering device and a second steering device; the reference light path is sequentially provided with a first reflecting mirror, a round shielding plate attached to the first reflecting mirror, a second half wave plate and a second polarizing plate; a first 4f imaging system; a second 4f imaging system; a beam-splitting prism; the first lens is used for converging the light beams after the beam splitting prism is combined and converged; and a hologram recording material disposed at a focal position of the first lens. Solves the problems of complex processing process and high preparation cost existing in the prior method.

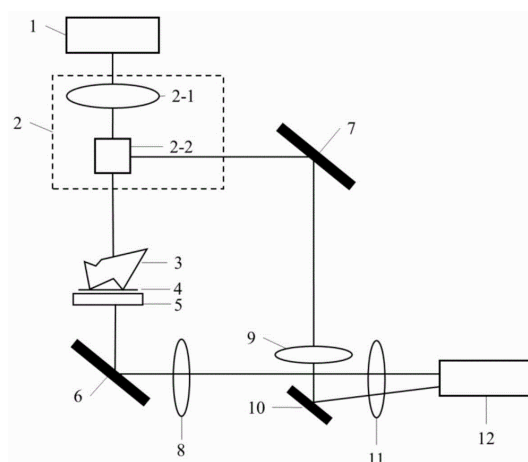


CLAIM 1. A scalar vortex beam generation system for in-line conventional or polarized holography comprising: a laser light source for generating laser light; the polarization beam splitter is used for dividing laser generated by the laser source into reference light and signal light; a reference light path for conveying the reference light; the signal light path is used for conveying the signal light; the signal light path is sequentially provided with an adjusting system and a first diaphragm, the adjusting system comprises a first half wave plate, a quarter wave plate, a first polaroid, a fan-shaped slit, a first steering device and a second steering device, the first half wave plate, the quarter wave plate, the first polaroid and the fan-shaped slit are sequentially arranged, the first steering device is used for rotating the first half wave plate, and the second steering device is used for rotating the fan-shaped slit; the reference light path is sequentially provided with a first reflecting mirror, a round shielding plate attached to the first reflecting mirror, a second half wave plate and a second polarizing plate; the first 4f imaging system is arranged between the adjusting system and the first diaphragm on the signal light path; a second 4f imaging system disposed between the first mirror and the second half-wave plate; the beam splitting prism is used for carrying out combination and aggregation on the reference light conveyed by the reference light path and the signal light path; the first lens is used for converging the light beams after the beam splitting prism is combined and converged; the holographic recording material is arranged at the focal position of the first lens and is used for interfering and recording the light beams converged by the first lens.

OFF-AXIS HOLOGRAPHIC BEAM COMBINING DEVICE AND METHOD BASED ON MISSING REFLECTOR

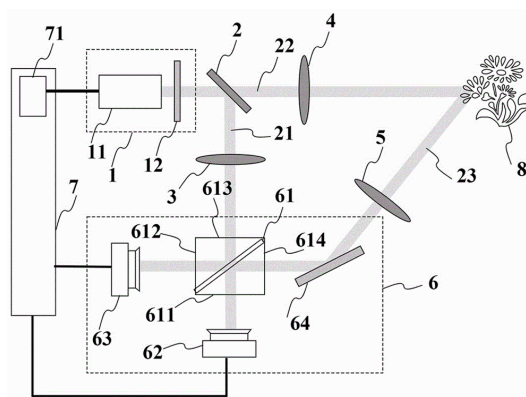
The invention discloses an off-axis holographic beam combining device and method based on a missing reflector. The invention adopts the missing reflector to combine the sample light and the reference light, does not have any shielding on the sample light during beam combination, only reflects the reference light, can realize a perfect beam combination scheme of nondestructive light intensity, and is more beneficial to realizing off-axis hologram of the reference light and the sample light; the problem that the superposition of the sample light and the reference light on the detector and the adjustment of the off-axis angle between the sample light and the reference light which are difficult to adjust in the off-axis holographic light path can be completely separated through the missing reflector, the problems are respectively and independently adjusted, and the superposition of the reference light and the sample light on the detection surface can be realized through adjusting the placement frame of the missing reflector; adjusting the off-axis angle between the sample light and the reference light by adjusting the position of the reference light irradiated to the missing reflector; the invention has low cost, is suitable for any light spot system, and does not need to build a light path again when the light spot changes.

CLAIM 1. An off-axis holographic beam combining device based on a missing reflector, which is characterized by comprising: the device comprises a light source, a beam splitting device, an objective table, a moving table, a sample light reflecting mirror, a reference light reflecting mirror, a first focusing lens, a second focusing lens, a missing reflecting mirror mounting frame, an imaging lens and a signal collecting device; the sample is placed on the objective table, the objective table is arranged on the moving table, and the moving table can drive the objective table and the sample to move in three dimensions; the second focusing lens is arranged on the translation stage, and the translation stage can drive the second focusing lens to move on the xy plane; the missing type reflecting mirror is arranged on the adjusting frame, and the adjusting frame can adjust the height, xyz plane position and pitch angle of the missing type reflecting mirror; the missing reflector is provided with a reflecting part and a light transmitting part, wherein a metal reflecting film is plated on the reflecting part to reflect the light beam; the light passing part does not shade light, and the light beam can directly pass through; the light source emits laser, the laser is split into two beams of light through the beam splitting device, one beam of light is used as sample light, and the other beam of light is used as reference light; after sample light passes through a sample, the transmitted light beam carries sample information, the light path of the sample light carrying the sample information is deflected after passing through a sample light reflector, the sample light is focused through a first focusing lens to form a focused light beam, a missing reflector is arranged at the focal plane of the focused light beam, the focus of the focused light beam is positioned at the light passing part of the missing reflector, the sample light carrying the sample information passes through the missing reflector without any light intensity loss, and the sample light is changed into parallel light after passing through an imaging lens; the reference light is reflected by the reference light reflector, is focused to the missing type reflector through the second focusing lens, and is incident to the reflecting surface of the missing type reflector to be reflected, so that the reflection efficiency is high, no light intensity loss exists, the reflected reference light is transmitted to the imaging lens, and the reflected reference light is changed into parallel light after passing through the imaging lens; the method comprises the steps that reference light and sample light are combined at a detection surface of a signal collecting device after passing through an imaging lens, an included angle is formed between the combined reference light and the sample light, light spots of the combined reference light and the sample light are overlapped on the detection surface of the signal collecting device to form interference, a detector acquires interference fringes formed by the combined reference light, and an included angle is formed between the combined reference light and the sample light to form off-axis holography; the position of the second focusing lens on the xy plane is adjusted through the translation stage, the position of the reference light incident on the second focusing lens and the position of the reference light incident on the reflection part of the missing reflecting mirror after being focused by the second focusing lens are adjusted, and then the included angle between the reference light and the sample light entering the detection surface is adjusted, so that the degree of the density of interference fringes is adjusted; the height, the horizontal position and the pitch angle of the missing type reflecting mirror are adjusted through the adjusting frame for placing the missing type reflecting mirror, so that light spots of reference light with different incidence angles are overlapped with light spots of sample light on a detection surface, and the adjustment of the included angle between the reference light and the sample light and the adjustment of the overlapping of the light spots are mutually independent.



ANTI-INTERFERENCE HOLOGRAPHIC IMAGE GENERATION SYSTEM AND METHOD BASED ON QUANTUM INTERFERENCE

The application provides an anti-interference holographic image generation system and method based on quantum interference. The light source generates coherent pulse light beams, the beam splitter splits the pulse light beams into two beams, one beam is transmitted to the target object through the emergent module to form coherent echoes, the other beam is directly incident into the HOM interference element to interfere with the coherent echoes, and an interference pattern is formed. The holographic image generation method provided by the application carries out normalized coincidence measurement and space inversion calculation on the interference pattern, acquires the amplitude and phase information of the target object, and generates a hologram. The system of the technical scheme of the application has simple structure and stable performance, effectively eliminates the influence of environmental noise in long-distance imaging through the space inversion calculation of HOM interference, and can generate high-quality images under the condition of weak light.



CLAIM 1. An anti-interference holographic image generation system based on quantum interference, which realizes holographic imaging of a target object through HOM (Hong-Ou-Mandel) interference and space inversion calculation, characterized in that the anti-interference holographic image generation system comprises: the light source comprises a pulse laser and is used for generating a pulse light beam, wherein the light field of the pulse light beam is a coherent light field; a beam splitter for splitting the pulse beam into a first beam and a second beam; the first lens is arranged on the first light beam and used for converging the first light beam; the emergent module is arranged on the second light beam and comprises a second lens, and is used for converging and transmitting the second light beam to the target object; a receiving module including a third lens for receiving a coherent echo reflected by the second light beam via the target object; an interferometry module comprising a HOM interferometer, a first detector and a second detector, the first beam passing through the first lens to a first input of the HOM interferometer, the coherent echo passing through the receive module to a second input of the HOM interferometer, the first beam and the coherent echo interfering with each other within the HOM interferometer and generating a first interference pattern at a first output of the HOM interferometer and a second interference pattern at a second output of the HOM interferometer, the first detector being configured to measure the first interference pattern and the second detector being configured to measure the second interference pattern; the image generation module is electrically connected with the first detector and the second detector and is used for carrying out normalized coincidence measurement and space inversion calculation on the first interference pattern and the second interference pattern to generate a holographic image of the target object.

N9829

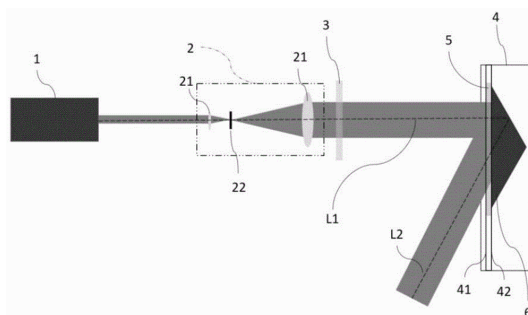
CN117008235

Priority Date: 22/08/2023

GENERAL INTERFACE SOLUTION | GIS TECHNOLOGY | INTERFACE OPTOELECTRONIC | YECHENG PHOTOELECTRIC WUXI

APPARATUS AND METHOD FOR MANUFACTURING HOLOGRAM OPTICAL ELEMENT

The application relates to a manufacturing device of a holographic optical element, which comprises a laser light source for emitting laser along a first optical axis, a beam expanding assembly arranged in front of the laser light source along the advancing direction of the first optical axis and used for converting the laser into beam expanding light, a polaroid arranged in front of the beam expanding assembly along the advancing direction of the first optical axis and used for converting the beam expanding light into polarized light, a manufacturing jig arranged in front of the polaroid along the advancing direction of the first optical axis and used for converting the polarized light into reflected light along a second optical axis. The reflected light penetrates the manufacturing jig, and the polarized light and the reflected light interfere with each other in the manufacturing jig, so that the holographic photosensitive film placed in the manufacturing jig is manufactured into the holographic optical element. Because the distance between the reflecting component and the manufacturing jig can be quite close, the defects of contrast reduction, refractive index variation reduction and the like can be improved when vibration occurs, and the yield of the holographic optical element can be maintained.



CLAIM 1. A device for manufacturing a hologram optical element, comprising: a laser light source for emitting laser light along a first optical axis; the beam expanding assembly is arranged in front of the laser light source along the advancing direction of the first optical axis and is used for converting the laser into beam expanding light; the polarizing plate is arranged in front of the beam expanding assembly along the advancing direction of the first optical axis and is used for converting the beam expanding light into polarized light; the manufacturing jig is arranged in front of the polaroid along the advancing direction of the first optical axis; and the reflection assembly is arranged in front of the manufacturing jig along the advancing direction of the first optical axis and is used for converting polarized light into reflected light along the second optical axis, the reflected light penetrates through the manufacturing jig, and the polarized light and the reflected light interfere with each other in the manufacturing jig.

N9837

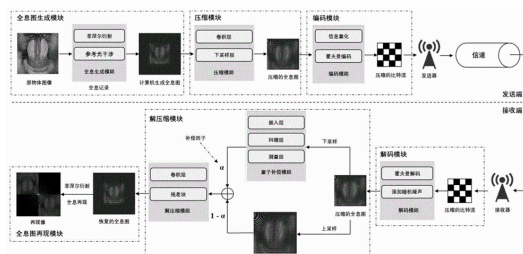
CN116957012

Priority Date: 27/07/2023

UNIVERSITY BEIJING

DIGITAL HOLOGRAPHIC COMPRESSION TRANSMISSION METHOD ADOPTING QUANTUM COMPENSATION HYBRID NEURAL NETWORK

The invention provides a digital holographic compression transmission method adopting a quantum compensation hybrid neural network, which is characterized in that an original image is recorded into a digital hologram through a Fresnel off-axis holographic algorithm, the digital hologram is compressed and decompressed based on the quantum compensation hybrid neural network, the digital hologram is quantized and dequantized by using an 8-bit quantization and random noise adding method, compressed data is encoded and decoded through Huffman coding, and finally, the restored hologram is reproduced to obtain a reproduced image. The method provided by the invention has faster parallel processing speed and better image recovery quality, and is suitable for the calculation processing of digital holograms, namely large data volume; the training of the compression network structure can be completed in fewer training times, and the compression transmission speed of the digital hologram is improved.



CLAIM 1. a digital holographic compression transmission method comprises the following specific steps: 1) Recording an image set containing an original 3D object through a Fresnel off-axis holographic calculation method and generating a hologram data set for computer generation; 2) Constructing a quantum compensation-based hybrid neural network, wherein the network consists of a compression block and a decompression block, a computer-generated hologram data set obtained in the step 1) is used in a model training stage to be sent into the quantum compensation-based hybrid neural network for joint training, the trained quantum compensation-based hybrid neural network is obtained, the network is split into the compression block and the decompression block, the compression block is arranged at a transmitting end, and the decompression block is arranged at a receiving end; 3) The transmitting end compresses the compressed blocks of the hybrid neural network based on quantum compensation in the step 2) to obtain a holographic floating point matrix, and after each numerical value of the matrix is quantized into an integer value between 0 and 255, a Huffman lossless coding algorithm is adopted to code the quantized matrix into a binary bit stream for transmission; 4) After receiving the bit stream sent by the sending end in the step 3), the receiving end decodes the bit stream through a Huffman decoding algorithm to obtain an integer matrix, generates quantization noise through uniform distribution of -1/2 to 1/2, adds the quantization noise to the integer matrix to obtain a floating point matrix, decompresses the floating point matrix through a decompression block of the mixed neural network based on quantum compensation trained in the step 2), and obtains a restored hologram; 5) And 4) reconstructing the hologram obtained by decompression in the step 4) to obtain an original object reconstruction image.

N9838

CN116954047

Priority Date: 10/07/2023

XIDIAN UNIVERSITY

MULTIDIMENSIONAL COMPLEX AMPLITUDE HOLOGRAPHIC IMAGING METHOD BASED ON WAVELENGTH DIVISION MULTIPLEXING OPTICAL WAVEGUIDE CHIP

The application discloses a multidimensional complex amplitude holographic imaging method based on a wavelength division multiplexing optical waveguide chip, which comprises the following steps: acquiring an image to be imaged containing a target, and preprocessing to obtain a plurality of slices; performing sparse aperture complex amplitude holographic imaging on each slice by using a Bessel weighting-based GS iterative algorithm to obtain a first pre-imaging result and a first modulation voltage corresponding to each slice; splicing the first pre-imaging result and the first modulation voltage to obtain a second pre-imaging result and a voltage time sequence; repairing based on the difference between the second pre-imaging result and the intensity characteristic distribution of the image to be imaged to get the second modulation voltage; and carrying out holographic imaging on the image to be imaged by using the second modulation voltage to obtain a holographic imaging result of the target. The application solves the problem of image distortion existing in the diffraction type wave-front encoding equipment, and the adopted chip structure can change the number of phase shifters used for carrying out phase modulation from N^2 to $3N$. The modulation power consumption of the optical waveguide phased array is greatly reduced by reducing the power consumption to $3N$.

Click on the title to return to table of contents

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

N9805

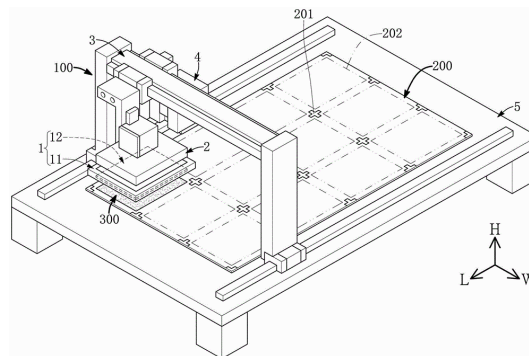
CN219903331U

Priority Date: 16/05/2023

GUANGQUN LASER SCIENCE & TEC

ALIGNMENT TYPE HOLOGRAPHIC FILM FORMING EQUIPMENT

An alignment type holographic film forming device, comprising: the workbench is provided with a pair of alignment type carriers, wherein the alignment type carriers are provided with a plurality of carrier alignment marks and define a plurality of stamping areas through the carrier alignment marks; the displacement mechanism is arranged on the workbench; the glue dispensing mechanism is arranged corresponding to the workbench and is used for setting an ultraviolet curing glue; and an imprint mask, the imprint mask comprising: a plate body formed with a plurality of mask alignment marks; a unit pattern layer; the alignment type holographic film forming equipment can align marks on at least two carriers beside any ultraviolet curing colloid, and then the imprinting photomask is imprinted along the height direction through the displacement mechanism, so that a plurality of ultraviolet curing colloids are sequentially imprinted to form a holographic film unit pattern respectively. Through the mutual matching between the mask alignment marks and the carrier alignment marks, the forming accuracy of a plurality of holographic film unit patterns is ensured.



CLAIM 1. An alignment type holographic film forming device, which is characterized by comprising: a workbench for arranging a pair of alignment type carriers on the workbench; the alignment type carrier is provided with a plurality of carrier alignment marks, and a plurality of stamping areas are defined by the alignment type carrier through the carrier alignment marks; the displacement mechanism is arranged on the workbench and can move relative to the workbench along a height direction, a transverse moving direction and a longitudinal moving direction which are mutually orthogonal; the dispensing mechanism is arranged corresponding to the workbench and is used for sequentially arranging an ultraviolet curing colloid in each stamping area; and an imprint mask coupled to the displacement mechanism, the imprint mask comprising: a plate body formed with a plurality of mask alignment marks; a kind of electronic device with high-pressure air-conditioning system. The unit pattern layer is formed on the plate body, and the positions of the unit pattern layer correspond to the plurality of photomask alignment marks; the alignment type holographic film forming equipment can align a plurality of mask alignment marks of the stamping mask along the height direction to at least two carrier alignment marks beside any ultraviolet curing colloid, and then the stamping mask is stamped along the height direction through the displacement mechanism, so that a plurality of ultraviolet curing colloid are stamped in sequence to form a holographic film unit pattern respectively.

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

N9784

WO2023210212

Priority Date: 27/04/2022

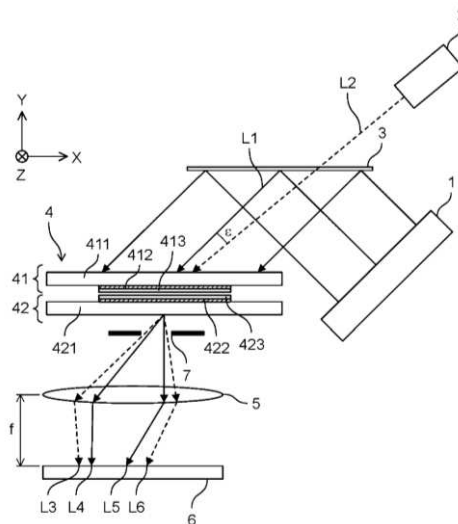
PANASONIC INTELLECTUAL PROPERTY MANAGEMENT

HOLOGRAM MANUFACTURING DEVICE AND HOLOGRAM MANUFACTURING METHOD

A hologram manufacturing device comprising a master hologram in which a diffraction grating is formed, a replicated hologram disposed close to the master hologram, a first light source that emits, to the master hologram and the replicated hologram, a first laser beam that satisfies the Bragg diffraction condition in the diffraction grating, a second light source that emits, to the master hologram and the replicated hologram, a second laser beam that does not satisfy the Bragg diffraction condition in the diffraction grating, and a sensor that measures the second laser beam. The hologram manufacturing device finishes the exposure of the replicated hologram by the first laser beam on the basis of a measurement result of the sensor.

DISPOSITIF DE FABRICATION D'HOLOGRAMME ET PROCÉDÉ DE FABRICATION D'HOLOGRAMME

Un dispositif de fabrication d'hologramme, celui-ci comprenant un hologramme maître dans lequel un réseau de diffraction est formé, un hologramme dupliqué disposé à proximité de l'hologramme maître, une première source de lumière qui émet vers l'hologramme maître et l'hologramme répliqué un premier faisceau laser qui satisfait la condition de diffraction de Bragg dans le réseau de diffraction, une seconde source de lumière qui émet vers l'hologramme maître et l'hologramme dupliqué un second faisceau laser qui ne satisfait pas la condition de diffraction de Bragg dans le réseau de diffraction, et un capteur qui mesure le second faisceau laser. Le dispositif de fabrication d'hologramme termine l'exposition de l'hologramme dupliqué par le premier faisceau laser sur la base d'un résultat de mesure du capteur.

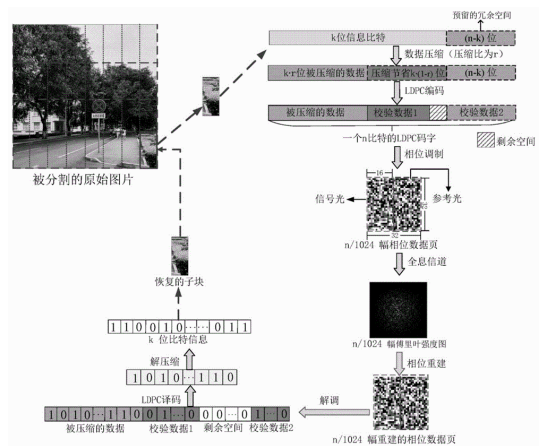


CLAIM 1. A master hologram having a diffraction grating formed thereon; a duplicate hologram arranged in proximity to the master hologram; a first light source for emitting a first laser beam satisfying Bragg diffraction conditions in the diffraction grating to the master hologram and the duplicate hologram; a second light source for emitting a second laser beam not satisfying Bragg diffraction conditions in the diffraction grating to the master hologram and the duplicate hologram; and a first laser beam is measured after passing through the master hologram and the duplicate hologram. The hologram manufacturing apparatus is provided with a sensor, and finishes the exposure of the duplicated hologram by the first laser beam based on the measurement result of the first sensor.

HOLOGRAPHIC STORAGE METHOD, DEVICE AND SYSTEM BASED ON DATA COMPRESSION

The invention discloses a holographic storage method, device and system based on data compression, which belongs to the field of holographic storage, and the writing process comprises the following steps: k-bit information data D to be written according to compression ratio r 0 After compression, according to LDPC encoding is performed to obtain the code rate of the codeBit verification data P 1 The method comprises the steps of carrying out a first treatment on the surface of the Compressed bit data and check data P 1 Andbit redundancy data combination into n-bit LDPC codeword C 1 The method comprises the steps of carrying out a first treatment on the surface of the Generation and C 1 After an equal amount of reference data, C 1 And the reference data is divided into bit data pages; and carrying out phase modulation on each bit data page to obtain a corresponding phase data page, and writing each phase data page into the holographic storage medium. The invention can improve the storage reliability of the holographic storage system without increasing the encoding/decoding difficulty.

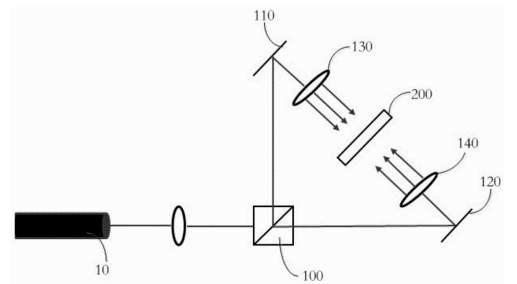
CLAIM 1. The holographic storage method based on data compression is characterized in that the data writing process comprises the following steps: (W1) k-bit information data D to be written in accordance with the compression ratio r 0 Compressing to obtain bit data D of k×r bits after compression 1 ; (W2) according to The code rate of (2) is to the bit data D 1 LDPC encoding to obtain Bit verification data P 1 ; (W3) converting the bit data D 1 Said verification data P 1 And bit redundancy data combination into n-bit LDPC codeword C 1 ; (W4) generating the LDPC codeword C 1 After the same amount of reference data, the LDPC codeword C 1 And the reference data is divided into A amplitude bit data page; half data in each bit data page is LDPC codeword C 1 The other half of the data is the bit in the reference data; (W5) phase modulating each bit data page to obtain a corresponding phase data page, and writing each phase data page into the holographic storage medium; wherein n is a constant, representing codeword length; l denotes the number of rows of the submatrices used to construct the LDPC coded check matrix, representing a downward rounding; size represents the size of the phase data page and M represents the order of the phase modulation.



HOLOGRAPHIC RECORDING MEDIUM AND DISPLAY DEVICE

The application provides a holographic recording medium, which comprises a film forming substance, a dye, a reactive monomer, a functional substance and a co-initiator, wherein the dye is used for generating free radicals with the co-initiator under the excitation of coherent light so as to lead the reactive monomer to generate polymerization reaction; wherein the film forming material is selected from at least one of vinyl acetate homopolymer, styrene/butadiene block copolymer and polyurethane material, and the active monomer is C4-C20 carbon chain molecule with at least one acrylic ester structure; the functional substance is an acrylate monomer containing six functionalities. The functional substance has six functionalities, so that the sensitization effect is more obvious, and the active monomer can be effectively promoted to form a required crosslinking structure, so that the polymerization efficiency of the active monomer is improved, the structure of stabilizing the grating size is facilitated, and the diffraction efficiency of the holographic recording medium is obviously improved. In addition, the application also provides a display device.

CLAIM 1. A holographic recording medium comprising a film-forming material, a photoinitiator, a reactive monomer, and a functional material, wherein the photoinitiator comprises a dye and a co-initiator, and the dye is used for generating free radicals with the co-initiator under the excitation of coherent light so as to cause the reactive monomer to generate polymerization reaction; wherein the film forming material is selected from at least one of vinyl acetate homopolymer, styrene/butadiene block copolymer and polyurethane material, and the active monomer is C with at least one acrylic ester structure 4 -C 20 A carbon chain molecule; the functional substance is an acrylate monomer containing six functionalities.



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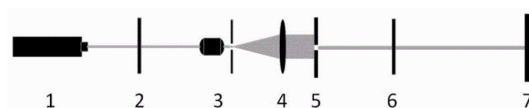
CN117031601

Priority Date: 21/08/2023

HEFEI UNIVERSITY OF TECHNOLOGY

EXPOSURE DEVICE FOR PREPARING VOLUME HOLOGRAPHIC GRATING

The invention relates to an exposure device for preparing a volume holographic grating, and belongs to the technical field of holographic optics. The device comprises a laser, a shutter, a pinhole filter, a lens and a diaphragm which are coaxially and sequentially arranged; the device also comprises a diffraction optical element coaxially arranged at one side of the emergent light of the diaphragm, and the working surface of the diffraction optical element corresponds to the exposure area of the coaxial holographic recording material to be processed; when the device works, the emergent light of the diffraction optical element forms an interference fringe distribution light field on the exposure area of the holographic recording material, so that a volume holographic grating with refractive index periodically distributed is formed in the photosensitive material, and customized exposure processing of the holographic recording material is completed. The diffraction optical element is made of high-transmittance material, and a phase diagram ϕ is generated by utilizing a phase recovery algorithm DOE. The corresponding phase delay ϕ with steps above the second order on the working surface can be obtained by micro-processing on the substrate DOE. Is a relief microstructure diffractive optical element. Compared with the traditional exposure device, the contrast of the interference fringes of 0.5 is improved by 52%.



CLAIM 1. The utility model provides an exposure device of preparation volume holographic grating, includes coaxial laser instrument (1), shutter (2), pinhole filter (3), lens (4) and diaphragm (5) that set gradually, and the work piece is holographic recording material (7) of coaxial setting, its characterized in that: the holographic optical disk also comprises a diffraction optical element (6), wherein the diffraction optical element (6) is coaxially arranged on the emergent light side of the diaphragm (5), and the working surface of the diffraction optical element (6) corresponds to the exposure area of the holographic recording material 7; the distance between the diffractive optical element (6) and the holographic recording material (7) is the same as the diffraction distance z of the diffractive optical element (6); the diffractive optical element (6) is made of a high-transmittance material, and a phase diagram ϕ is generated by using a phase recovery algorithm DOE. By micro-machining on a substrate of high-transmittance material, processing to obtain the corresponding phase delay ϕ with steps above two orders on the working surface DOE. A diffractive optical element (6) of a relief microstructure; the size of a light spot emitted by the pinhole filter (3) is larger than the diameter of the lens (4); when the device works, laser emitted by the laser (1) is emitted into the diffraction optical element (6) through the shutter (2), the pinhole filter (3), the lens (4) and the diaphragm (5), the diffraction optical element (6) carries out phase regulation and control on incident light spots, emergent light of the diffraction optical element (6) forms a stripe distribution light field on an exposure area of the holographic recording material (7), exposure power and exposure time are controlled, and the shutter (2) is closed; and forming a volume holographic grating with refractive index periodically distributed on the photosensitive material of the holographic recording material (7), and completing customized exposure processing of the holographic recording material (7).

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

P26406

OVD – PRINTING – BANKNOTE

N9783

WO2023219251

Priority Date: 12/05/2022

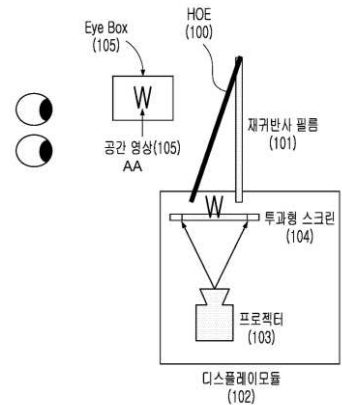
WONKWANG UNIVERSITY INDUSTRY ACADEMIC COOPERATION FOUNDATION

HOLOGRAPHIC OPTICAL ELEMENT-BASED SLIM-TYPE SPATIAL IMAGE DISPLAY SYSTEM

The present invention relates to a holographic optical element-based slim-type spatial image display system comprising a holographic optical element and a retroreflective film. In addition, the holographic optical element-based slim-type spatial image display system comprises eye-box size/image formation position parameter information as parameter information for adjusting optical characteristics of restored images. In addition, the holographic optical element-based slim-type spatial image display system has a relay optical element (102-1) installed to adjust the optical path of a primarily formed image. The present invention is applicable to various fields such as culture/art contents and performances. A holographic optical element can be used to adjust the angle of diffraction of an incident ray as desired. A diffracted ray can be directed to a retroreflective film regardless of the inclination of the holographic optical element. A ray incident onto the retroreflective film is retroreflected such that a distortion-free spatial image can be made. Therefore, the present invention is noticeably advantageous in that a spatial image reproducing display having a relatively thin structure can be fabricated, spatial images having various characteristics can be reproduced according to HOE design, and HOE design for satisfying various requirements (for example, display installation environments, increased illusion of depth of reproduced spatial images) is possible.

SYSTÈME D’AFFICHAGE D’IMAGE SPATIALE DE TYPE MINCE BASÉ SUR UN ÉLÉMENT OPTIQUE HOLOGRAPHIQUE

La présente invention concerne un système d’affichage d’image spatiale de type mince basé sur un élément optique holographique comprenant un élément optique holographique et un film rétro réfléchissant. De plus, le système d’affichage d’image spatiale de type mince basé sur un élément optique holographique comprend des informations de paramètre de taille de zone oculaire/de position de formation d’image en tant qu’informations de paramètre servant à ajuster des caractéristiques optiques d’images restaurées. De plus, le système d’affichage d’image spatiale de type mince basé sur un élément optique holographique comporte un élément optique de relais (102-1) qui est installé pour ajuster le trajet optique d’une image essentiellement formée. La présente invention peut être appliquée à divers domaines tels qu’aux contenus et aux performances de nature culturelle ou artistique. Un élément optique holographique peut être utilisé pour ajuster l’angle de diffraction d’un rayon incident selon les besoins. Un rayon diffracté peut être dirigé vers un film rétro réfléchissant indépendamment de l’inclinaison de l’élément optique holographique. Un rayon incident sur le film rétro réfléchissant est rétro réfléché de façon à ce qu’une image spatiale sans distorsion puisse être créée. Par conséquent, la présente invention est particulièrement avantageuse en ce qu’un dispositif d’affichage de reproduction d’image spatiale ayant une structure relativement mince peut être fabriqué, des images spatiales ayant diverses caractéristiques peuvent être reproduites selon une conception d’élément optique holographique (HOE), et une conception de HOE destinée à satisfaire diverses exigences (des environnements d’installation d’affichage, des images spatiales reproduites ayant une illusion de profondeur accrue, par exemple) est possible.



- 101 ... Retroreflective film
- 102 ... Display module
- 103 ... Projector
- 104 ... Transmissive screen
- 105 ... Eye Box
- AA ... Spatial image

CLAIM 1. A slim spatial image display system based on holographic optical elements, characterized in that it consists of a holographic optical element and a retroreflective film.

COMPOSITE PANE WITH A REFLECTIVE LAYER AND A HOLOGRAM ELEMENT

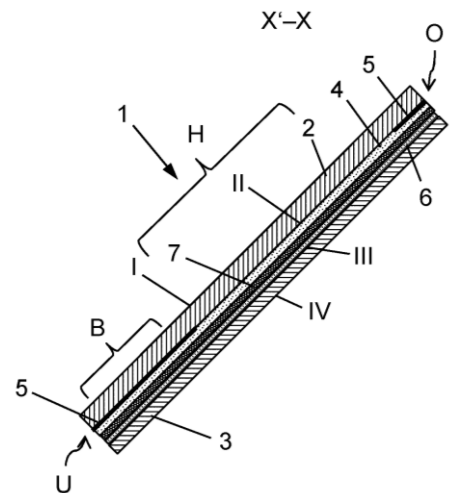
The invention relates to a composite pane (1) with a projection region (B) and a main see-through region (H), at least comprising an outer pane (2), an inner pane (3), a thermoplastic intermediate layer (4), an opaque masking layer (5), a reflective layer (6) and a hologram element (7), wherein the projection region (B) is arranged outside the main see-through region (H), the reflective layer (6) is suited for reflecting p-polarised light and is arranged at least in the projection region (B), the hologram element (7) is arranged at least in the projection region (B), has a hologram arranged in the projection region (B) and created in one or more layers of a holographic material, and the hologram element is arranged spatially behind the reflective layer (6) when looking through the composite pane (1) from the inside, the opaque masking layer (5) is arranged outside the main see-through region (H) and is arranged spatially behind the hologram element (7) when looking through the composite pane (1) from the inside, and the projection region (B) lies entirely in the region of the composite pane (1) in which the opaque masking layer (5) is arranged, when looking through the composite pane (1) in the perpendicular direction.

VITRE COMPOSITE DOTÉE D'UNE COUCHE RÉFLÉCHISSANTE ET D'UN ÉLÉMENT HOLOGRAPHIQUE

La présente invention concerne une vitre composite (1) comprenant une région de projection (B) et une région transparente principale (H), comprenant au moins une vitre externe (2), une vitre interne (3), une couche intermédiaire thermoplastique (4), une couche de masquage opaque (5), une couche réfléchissante (6) et un élément holographique (7), la région de projection (B) étant disposée à l'extérieur de la région transparente principale (H), la couche réfléchissante (6) étant conçue pour réfléchir la lumière polarisée p et étant disposée au moins dans la région de projection (B), l'élément holographique (7) étant disposé au moins dans la région de projection (B), présente un hologramme disposé dans la région de projection (B) et créé dans une ou plusieurs couches d'un matériau holographique, et l'élément holographique est disposé dans l'espace derrière la couche réfléchissante (6) lorsque l'on regarde à travers la vitre composite (1) depuis l'intérieur, la couche de masquage opaque (5) est disposée à l'extérieur de la région transparente principale (H) et est disposée dans l'espace derrière l'élément holographique (7) lorsque l'on regarde à travers la vitre composite (1) depuis l'intérieur, et la région de projection (B) se trouve entièrement dans la région de la vitre composite (1) dans laquelle la couche de masquage opaque (5) est disposée, lorsque l'on regarde à travers la vitre composite (1) dans la direction perpendiculaire.

CLAIM 1. Composite pane (1) with a projection region (B) and a projection region (B)

Main transparent area (H), at least comprising an outer pane (2), an inner pane (3), a thermoplastic intermediate layer (4), an opaque masking layer (5), a reflection layer (6) and a hologram element (7), wherein the outer pane (2) has an outer surface (I) facing away from the thermoplastic intermediate layer (4) and an inner space-side surface (II) facing the thermoplastic intermediate layer (4), and the inner pane (3) has an outer surface (III) facing the thermoplastic intermediate layer (4) and an inner space-side surface (IV) facing away from the thermoplastic intermediate layer (4), the projection area (B) is arranged outside the main transparent area (H), the reflection layer (6) is suitable for reflecting p-polarized light and is arranged at least in the projection area (B), the hologram element (7) is arranged at least in the projection area (B), a hologram arranged in the projection area (B) is produced in one or more layers of a holographic material. The opaque masking layer (5) is arranged outside the main transparent region (H) when viewed through the composite pane (1) from the inside and is arranged spatially behind the reflection layer (6) when viewed through the composite pane (1) from the inside. The projection region (B) when viewed perpendicularly through the composite pane (1) lies completely in the region of the composite pane (1) in which the opaque masking layer (5) is arranged.

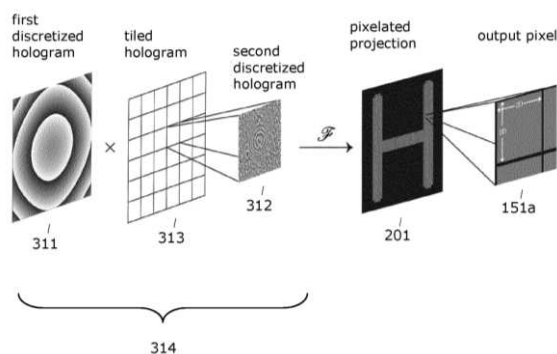


HOLOGRAPHIC SYSTEM WITH IMPROVED PROJECTION QUALITY

The invention relates to a method for generating a pixelated projection in a reconstruction space. The method includes determination of a first discretized hologram, wherein the first discretized hologram is determined to generate a desired amplitude profile of an output pixel in the reconstruction space; determination of a second discretized hologram having a phase distribution determined to create a desired projection in the reconstruction space; determination of a tiled hologram by tiling the second discretized hologram a number of one or more times in one or two directions, wherein the number of tilings and the first discretized hologram are determined subject to an output pixel constraint determined based on a dimension of the amplitude profile of the output pixel in the reconstruction space and a pixel pitch in the reconstruction space. A composite hologram is determined based on a phasor multiplication of the first discretized hologram and the tiled hologram. A coherent input beam is phase modulated based on the composite hologram so that the phase modulated beam generates the pixelated projection in the reconstruction space. A particular application of the invention is the use for volumetric additive manufacturing (VAM), especially for medical use, such as implants.

SYSTÈME HOLOGRAPHIQUE À QUALITÉ DE PROJECTION AMÉLIORÉE

L'invention concerne un procédé permettant de générer une projection pixelisée dans un espace de reconstruction. Le procédé consiste à déterminer un premier hologramme discrétisé, le premier hologramme discrétisé étant déterminé pour générer un profil d'amplitude souhaité d'un pixel de sortie dans l'espace de reconstruction ; à déterminer un second hologramme discrétisé ayant une distribution de phase déterminée pour créer une projection souhaitée dans l'espace de reconstruction ; à déterminer un hologramme en mosaïque en juxtaposant le second hologramme discrétisé une ou plusieurs fois dans une ou deux directions, le nombre d'itérations de juxtaposition et le premier hologramme discrétisé étant déterminés en fonction d'une contrainte de pixel de sortie déterminée sur la base d'une dimension du profil d'amplitude du pixel de sortie dans l'espace de reconstruction et d'un pas de pixel dans l'espace de reconstruction. Un hologramme composite est déterminé sur la base d'une multiplication de phaseur du premier hologramme discrétisé et de l'hologramme en mosaïque. Un faisceau d'entrée cohérent est modulé en phase sur la base de l'hologramme composite de façon à ce que le faisceau modulé en phase génère la projection pixelisée dans l'espace de reconstruction. Une application particulière de l'invention consiste en son utilisation pour la fabrication additive volumétrique (VAM), en particulier pour le domaine médical, tel que pour des implants.



CLAIM 1. A method for generating a pixelated projection (201) in a reconstruction space (111) comprising: - determining a first discretized hologram (311) having a phase distribution in a plane, wherein the first discretized hologram is determined to generate a desired amplitude profile (151-153) of an output pixel (151a-153a) in the reconstruction space, - determining a second discretized hologram (312) having a phase distribution determined to create a desired projection in the reconstruction space, - determining or generating a tiled hologram (313) by tiling the second discretized hologram a number (NT, NT1, NT2) of one or more times in one or two directions, wherein the number of tilings and the first discretized hologram are determined subject to an output pixel constraint determined based on a dimension (AXpsf, AYpsf) of the amplitude profile of the output pixel (151a-153a) in the reconstruction space and a pixel pitch (AXholo, AYholo) in the reconstruction space, - determining a composite hologram (314) based on a phasor multiplication of the first discretized hologram and the tiled hologram, - phase modulating a coherent input beam (101) based on the composite hologram and directing the phase modulated beam towards the reconstruction space to generate the pixelated projection in the reconstruction space.

N9788

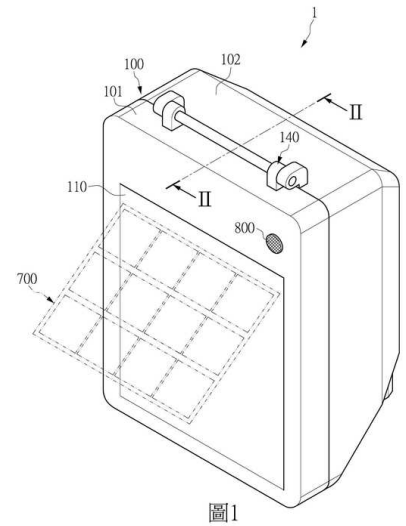
TWM646260

Priority Date: 10/11/2022

XU, SHU-CHENG

HOLOGRAPHIC PROJECTION DEVICE

The invention discloses a floating projection device, which comprises a main body with a mounting base used for fixing an electronic device, wherein the electronic device is provided with a display panel used for outputting a display picture; an intermediate optical unit which is a plate body formed by a transparent medium material; the light of the display picture output by the electronic device enters from the light inlet side of the intermediate optical unit, and then the intermediate optical unit changes the path of the light, and the display picture output by the electronic device is imaged on a virtual image plane which is arranged on the light outlet side of the intermediate optical unit; a transparent panel is arranged on the light outlet side of the intermediate optical unit; a space detection module is used for detecting the gesture action of a user or identifying the biological information of the user, so as to enable the user to input operation instructions through the gesture or the biological information.



CLAIM 1. A floating projection device for forming a floating projection image of the image displayed by an electronic device, the floating projection device comprises: a body, the body comprising a transparent panel, a mounting seat for mounting the electronic device, and a connecting device capable of electrically connecting the electronic device; an intermediate optical unit, the intermediate optical unit being a plate body formed of a transparent medium material, the two opposite sides of the intermediate optical unit being capable of defining a light inlet side and a light outlet side, and the intermediate optical unit having a light inlet side and a light outlet side. The light inlet side faces a display panel of the electronic device, and the light outlet side faces the transparent panel; the light of a display picture output by the display panel of the electronic device enters the intermediate optical unit from the light inlet side, and then the intermediate optical unit changes the path of the light, so that the display picture is imaged on a virtual image plane located on the light outlet side of the intermediate optical unit; and a spatial detection module is arranged in the main body for detecting the gesture action of a user or identifying the biological information of the user, so that the user can input operation instructions through the gesture or the biological information.

N9789

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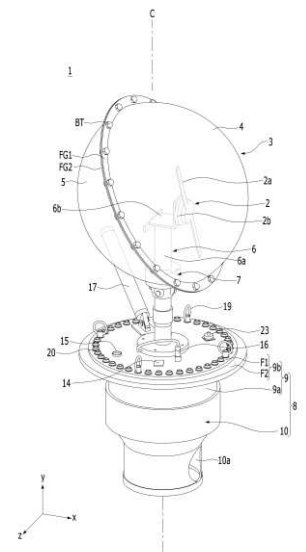
Priority Date: 25/04/2022

KOREA MARINE ENVIRONMENT MANAGEMENT | STN

HOLOGRAM DISPLAY DEVICE

The present invention provides a hologram display device that can be easily identified even from a long distance.

CLAIM 1. A hologram display device comprising: a hologram unit including a blade and a motor configured to rotate the blade; a transparent housing configured to accommodate the hologram unit; a body unit including a power source unit configured to apply power; and a shaft unit configured to connect the hologram unit and the body unit.



N9790

KR20230150121
Priority Date: 21/04/2022

KOREA ELECTRONICS & TELECOMMUNICATIONS RESEARCH
INSTITUTE

APPARATUS AND METHOD FOR PLAYING STEREOSCOPIC SENSORY CONTENT

The present disclosure relates to an apparatus and a method for playing stereoscopic sensory content. The stereoscopic sensory content reproduction apparatus comprises: a display device for restoring hologram data inputted by using a light source having coherence into a hologram image; a user sensing device for obtaining sensing information corresponding to a hand motion by monitoring the hand motion of a user; a haptic device including a plurality of tactile generation sources and generating haptic stimulation by using at least one tactile generation source; and an integrated control device for obtaining first position information of a hologram object included in the hologram image based on the hologram data, obtaining second position information of the hand of the user based on the sensing information, detecting a virtual contact in which a position of the hand is overlapped with a surface region of the hologram object based on the first and second position information, and controlling the haptic device to generate haptic stimulation corresponding to a surface texture of the hologram object at the position of the hand when the virtual contact is detected.

CLAIM 1. An apparatus for reproducing stereoscopic real-sense content, the apparatus comprising: a display device configured to restore hologram data input using a light source having coherence into a hologram image; a user sensing device configured to monitor a hand motion of a user to obtain sensing information corresponding to the hand motion; a haptic device comprising a plurality of tactile generation sources and configured to generate haptic stimuli using the plurality of tactile generation sources; and an integrated control device configured to obtain first position information of a hologram object included in the hologram image based on the hologram data, obtain second position information of the hand of the user based on the sensing information, detect a virtual contact in which a position of the hand overlaps a surface region of the hologram object based on the first and second position information, and control the haptic device to generate haptic stimuli corresponding to a surface texture of the hologram object at the position of the hand when the virtual contact is detected.

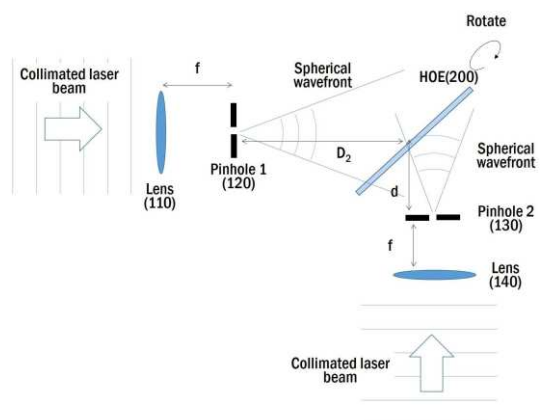
N9792

KR102597352
Priority Date: 28/12/2022

KOREA ELECTRONICS TECHNOLOGY INSTITUTE

METHOD OF REPRODUCING MULTI-DEPTH IMAGE USING HOLOGRAPHIC OPTICAL ELEMENT

Provided is a method for reproducing a multi-depth image using an HOE. According to an embodiment of the present invention, the method for recording the HOE for the HUD capable of playing multiple-depth images comprises the steps of: rotating the HOE in stages; adjusting a distance between a central pixel of a virtual image screen and the HOE in stages; and recording lens characteristics on the HOE while the rotation and adjustment are performed in stages. Therefore, the distance between the central pixel of the virtual image screen and the HOE and the rotation angle of the HOE are adjusted stepwise and the multi-focus lens characteristic for the HUD is recorded in the HOE, thereby implementing the HOE-based HUD capable of playing a three-dimensional image through the virtual image screen image having multiple depths.



CLAIM 1. A holographic optical element (HOE) recording method comprising: rotating a HOE around a normal line at a center of the HOE in a stepwise manner; adjusting a distance between a central pixel of a virtual image screen and the HOE in a stepwise manner; and recording a lens characteristic in the HOE while the rotating and adjusting steps are performed in the stepwise manner, wherein the adjusting step is performed while the distance between the central pixel of the real image screen and the HOE is fixed.

N9794

GB2618630

Priority Date: 20/10/2022

ENVISICS

HOLOGRAM CALCULATION FOR COMPACT HEAD-UP DISPLAY

A method of calculating a sub-hologram of a virtual image point for an optical system comprising a display device arranged to display the sub-hologram and a waveguide arranged to replicate the sub-hologram is disclosed. The method comprises determining an area delimited by straight line paths from the computer-generated image point to the perimeter of an entrance pupil of a viewer (Fig. 7), wherein the area comprises a first area component 810' on a first virtual copy of the display 810 and a second region component 811' on a second virtual replica 811 of the display. A first sub-hologram component of the virtual image point within the first area component and a second sub-hologram component of the virtual image point within the second area component are determined. The first and second sub-hologram components are superimposed to form a sub-hologram of the virtual image point. The method further comprises applying a local phase-ramp function to at least one of the area elements. Different phase-ramp functions may be applied to the two parts. The functions may be related to parameters of the regions or sub-holograms.

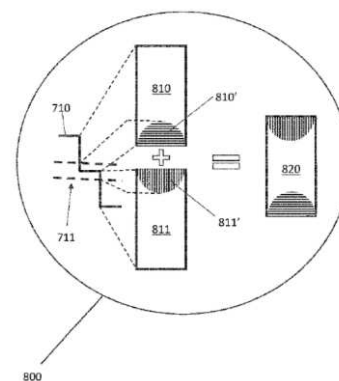
CLAIM 1. A method of calculating a sub-hologram of a virtual image point for an optical system comprising a display device arranged to display the sub-hologram and a waveguide arranged to replicate the sub-hologram, wherein the method comprises:

determining an area delimited by straight line paths from the virtual image point to the perimeter of an entrance pupil of a viewer, wherein the area comprises a first area component on a first virtual replica of the display device and a second area component on a second virtual replica of the display device;

determining a first sub-hologram component of the virtual image point within the first area component and a second sub-hologram component of the virtual image point within the second area component;

superimposing the first sub-hologram component and second sub-hologram component to form a sub-hologram of the virtual image point, wherein the method further comprises:

applying a local phase-ramp function to at least one of the first area component and second area component.



N9795

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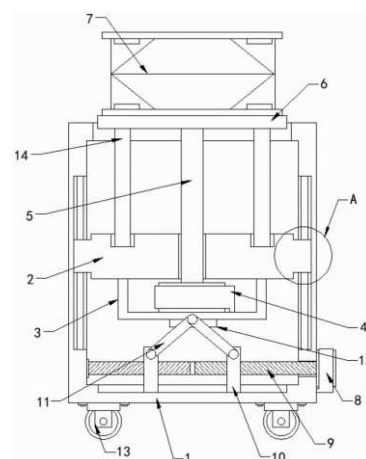
Priority Date: 13/06/2023

SHENZHEN LIZHI TECHNOLOGY

360-DEGREE HOLOGRAPHIC IMAGING DEVICE

The utility model discloses a 360-degree holographic imaging device, which comprises a supporting box, wherein a bearing plate is arranged in the supporting box, the bottom of the bearing plate is fixedly connected with a supporting frame, a first motor is fixedly connected in the supporting frame, an output shaft of the first motor is fixedly connected with a rotating rod, the top end of the rotating rod penetrates through the bearing plate and is fixedly connected with a mounting plate, the top of the mounting plate is fixedly connected with a holographic imaging device body, the top of the supporting box is provided with an opening corresponding to the holographic imaging device body, the outer wall of one side of the supporting box is fixedly connected with a second motor, the output end of the second motor is fixedly connected with a threaded rod, and one end of the threaded rod is rotatably connected with the inner wall of the supporting box.

CLAIM 1. 360 holographic image device of degree, including supporting box (1), its characterized in that: be equipped with loading board (2) in supporting box (1), the bottom fixedly connected with carriage (3) of loading board (2), first motor (4) of fixedly connected with in carriage (3), the output shaft fixedly connected with bull stick (5) of first motor (4), the top of bull stick (5) runs through loading board (2) and fixedly connected with mounting panel (6), the top fixedly connected with holographic imaging device body (7) of mounting panel (6), the top of supporting box (1) is equipped with the opening that corresponds with holographic imaging device body (7), fixedly connected with second motor (8) on one side outer wall of supporting box (1), the output fixedly connected with threaded rod (9) of second motor (8), the one end and the supporting box (1) inner wall rotation of threaded rod (9) are connected, the screw thread of the horizontal direction of threaded rod (9) both sides is the opposite setting, movable plate (10) have been cup jointed at the both ends of threaded rod (9), movable plate (10) are gone up and are connected with traction plate (11) and traction plate (12) are connected with one end fixedly connected with traction plate (12).



N9796

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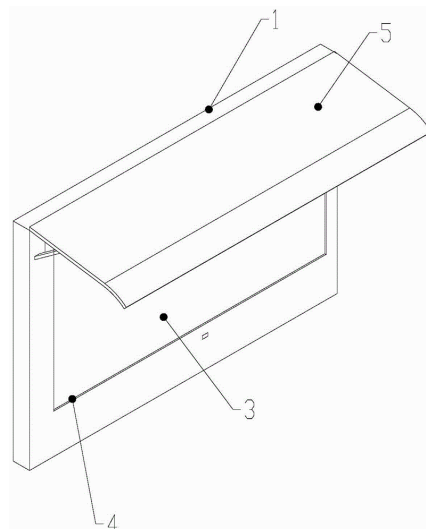
Priority Date: 13/06/2023

SHANGHAI INTLIGHT THIN FILM TECHNOLOGY

TRANSPARENT HOLOGRAPHIC PROJECTION DISPLAY PROTECTION FILM EXTERNALLY ATTACHED TO GLASS CURTAIN WALL

The utility model belongs to the technical field of holographic projection, and particularly relates to a transparent holographic projection display protective film externally attached to a glass curtain wall, which solves the problems that a protective film layer is difficult to replace and has poor dustproof effect in the prior art.

CLAIM 1. The utility model provides a glass curtain wall pastes transparent holographic projection display protection film outward, includes glass frame (1), its characterized in that: the glass frame is characterized in that a glass layer (2) is fixedly connected to the inside of the glass frame (1) through screws, a protective film layer (3) is arranged inside the glass frame (1), a first sliding block (11) is slidably assembled inside the glass frame (1), a withdrawal rod (8) is fixedly connected to one side of the first sliding block (11) through screws, and a handle (7) is fixedly connected to one side of the withdrawal rod (8) through screws; the inside slip of glass frame (1) is equipped with second slider (13), the bottom of second slider (13) is through screw fixedly connected with dog (6), one side of glass frame (1) is through screw fixedly connected with fixed block (14).



N9798

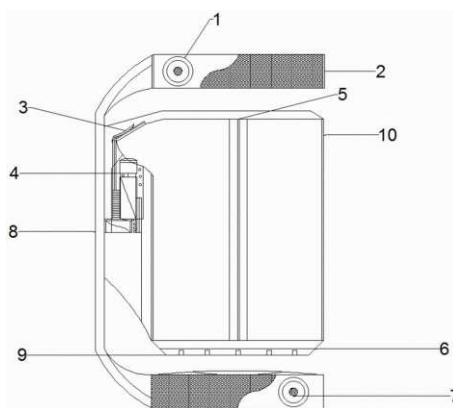
CN219999515U

Priority Date: 09/03/2023

SICHUAN BINGFENG TECHNOLOGY

INTELLIGENT HOLOGRAPHIC PROJECTION SOUND BOX

The utility model discloses an intelligent holographic projection sound box, which comprises a sound box unit housing, wherein the sound box unit housing is a shell with a C-shaped cross section and a flat plate structure at the top and bottom, arc angles are inverted at the joints of the top and bottom of the C-shaped cross section and the side parts, an upper sound unit element is arranged at the top of the sound box unit housing, a lower sound unit element is arranged at the bottom of the sound box unit housing, an alloy cylinder is arranged at the side part of the C-shaped cross section of the sound box unit housing, a supporting plate is fixedly connected with the alloy cylinder, a projection assembly is arranged on the supporting plate, a sound box main body is arranged on one side of the supporting plate, and a holographic light-transmitting film is arranged on the sound box main body. The holographic display technology realizes the display of holographic images through various holographic projection technologies, can well display image effects, and the high-definition camera can be combined with a field picture in real time to interact with people in real time, and the relative 3D character can also be in a corresponding gesture.



CLAIM 1. An intelligent holographic projection stereo set, includes sound unit dustcoat (2), its characterized in that: the sound unit housing (2) is a shell with a C-shaped cross section and a flat plate structure at the top and the bottom, arc angles are inverted at the joints of the top and the bottom of the C-shaped cross section and the side parts, the top of the sound unit housing (2) is provided with an upper sound unit element (1), the bottom of the sound unit housing (2) is provided with a lower sound unit element (7), the side part of the C-shaped cross section of the sound unit housing (2) is an alloy cylinder (8), a supporting plate is fixedly connected to the alloy cylinder (8), a projection assembly (3) is arranged on the supporting plate, one side of the supporting plate is provided with a sound main body, and a holographic light-transmitting film (5) is arranged on the sound main body.

N9799

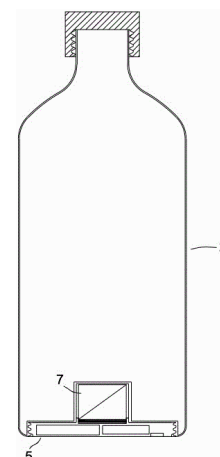
CN219989900U

Priority Date: 28/03/2023

DONGGUAN BASHUBAN DIGITAL TECHNOLOGY

WHITE SPIRIT BOTTLE WITH HOLOGRAPHIC DISPLAY DEVICE

The utility model discloses a white spirit bottle with a holographic display device, which comprises a transparent white spirit bottle and a holographic display component connected and matched with the white spirit bottle; the bottom center of the white spirit bottle is concave to form an installation groove, the installation groove consists of a deep section and a shallow section, and the square deep groove is formed by concave center of a circular shallow groove; the holographic display assembly is mounted in the mounting slot; the holographic display assembly comprises a base matched with the shallow groove in the mounting groove, a battery installed in the base, a control circuit, a display screen connected with the control circuit and embedded in the base deeply, and a beam splitting prism matched with the display screen on the base in a relative position, wherein the beam splitting prism is placed in the deep groove, and the control circuit is connected with the battery, supplies power to the display screen and provides image information. Compared with the existing white spirit bottles, the white spirit bottle body display three-dimensional and vivid images and animation effects on the white spirit bottle body, and the significance and uniqueness of customized white spirit can be improved.



CLAIM 1. A white spirit bottle with holographic display device, its characterized in that: comprises a transparent white spirit bottle and a holographic display component which is connected and matched with the white spirit bottle; the bottom center of the white spirit bottle is concave to form an installation groove, the installation groove consists of a deep section and a shallow section, and the square deep groove is formed by concave center of a circular shallow groove; the holographic display assembly is mounted in the mounting slot; the holographic display component comprises a base matched with a shallow groove in the mounting groove, a battery installed in the base, a control circuit, a display screen connected with the control circuit and embedded in the base deeply, and a beam splitting prism which is installed on the base and matched with the display screen in a relative position, wherein the beam splitting prism is placed in the deep groove, the control circuit is connected with the battery, supplies power to the display screen and provides image information, and the image is split and refracted by the beam splitting prism to form holographic display; in order to realize the light splitting and body folding, the light splitting prism reverses the content displayed by the display screen and refracts the content by 45 degrees to form holographic projection.

N9800

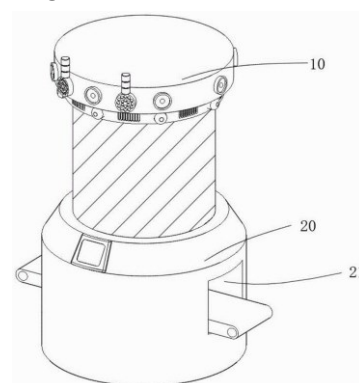
CN219980893U

Priority Date: 24/04/2023

NAIRUI LIGHTING SHANGHAI

HOLOGRAPHIC IMAGE EQUIPMENT BASED ON REMOTE INTERACTION PLATFORM

The utility model relates to the technical field of holographic image equipment, in particular to holographic image equipment based on a remote interaction platform, which comprises a projection interaction device and an installation base, wherein an arc interaction curtain is arranged below the projection interaction device and fixedly connected with the projection interaction device, the bottom of the arc interaction curtain is fixedly connected with the installation base, a through groove is formed in the installation base, a service component is arranged in the installation base, an intelligent control component is arranged in the projection interaction device, audible and visual alarms which are uniformly distributed in a surrounding mode are arranged outside the projection interaction device, the audible and visual alarms are fixedly connected with the projection interaction device, and finally, the interaction range is improved through exchange between the arc screen and a salesman, and further the working efficiency is improved.



CLAIM 1. A holographic image device based on a remote interaction platform is characterized in that: including projection interactive installation (10) and installation base (20), the below of projection interactive installation (10) is equipped with circular arc interactive curtain (16), circular arc interactive curtain (16) fixed connection projection interactive installation (10), the bottom fixed connection of circular arc interactive curtain (16) installation base (20), logical groove (21) have been seted up to installation base (20), the inside of installation base (20) is equipped with service component (24), the inside of projection interactive installation (10) is equipped with intelligent control subassembly (11), the outside of projection interactive installation (10) is equipped with evenly around distributed's audible-visual annunciator (12), audible-visual annunciator (12) fixed connection projection interactive installation (10).

N9801

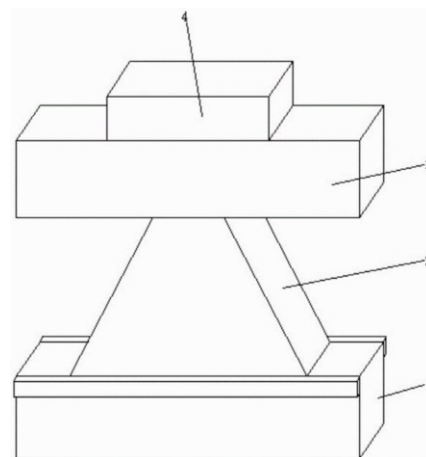
CN219978688U

Priority Date: 12/06/2023

SHANGHAI ZHENRUI MULTIMEDIA TECHNOLOGY

HOLOGRAPHIC PROJECTION DEVICE

The utility model discloses a holographic projection device which comprises a projection table, wherein the top of the projection table is fixedly connected with a triangular mirror surface, the top of the triangular mirror surface is fixedly connected with a light box, the top of the light box is fixedly connected with a heat dissipation box, the back end of the inner wall of the heat dissipation box is fixedly connected with a motor, the output end of the motor is fixedly connected with a rotary table, the bottom of the front end of the rotary table is fixedly connected with a fixed column, and the top of the inner wall of the heat dissipation box is slidably connected with a transmission plate. According to the utility model, through the arrangement of the motor, the turntable, the fixed column, the transmission plate and the fan, the motor can work to drive the turntable to rotate, the turntable rotates to drive the fixed column to rotate, the fixed column rotates to drive the transmission plate and the fan to horizontally move, the fan works to perform air cooling and heat dissipation on the lamplight box, the existing holographic projection is replaced by high-power use, high-temperature overload is easy to occur, and therefore the service life of the holographic projection is prolonged.



N9802

CN219958081U

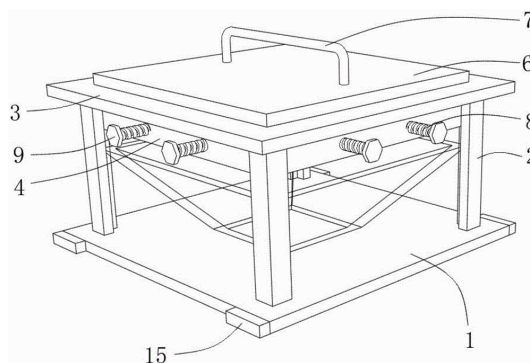
Priority Date: 19/05/2023

SHENYANG JINGXUAN INTELLIGENT DIGITAL TECHNOLOGY

MULTIMEDIA HOLOGRAPHIC PROJECTION DEVICE

The utility model relates to the technical field of holographic projection, and discloses a multimedia holographic projection device which comprises a connecting bottom plate, connecting columns, annular top plates, clamping ring blocks and upper glass plates, wherein the lower ends of the connecting bottom plate are clamped in four corners of the connecting bottom plate, the annular top plates are fixedly arranged at the top ends of the connecting columns at the bottoms of the four corners, the clamping ring blocks are sequentially fixed at the bottoms of the annular top plates, the clamping plates are arranged on the inner sides of the clamping ring blocks, inclined glass plates with an inclination angle of 45 degrees are arranged at the bottoms of the upper glass plates, an inverted conical table structure is formed by mutually fixing adjacent inclined glass plates, and the inclined glass plates are all fixed in the middle of the upper surface of the connecting bottom plate. According to the utility model, on the basis of convenient maintenance and replacement of the upper glass plate and the inclined glass plate, the projection source equipment with different sizes can be conveniently used and fixedly placed, unstable projection caused by shaking of the projection source equipment due to external collision can be prevented, and the holographic projection quality of the device is improved.

CLAIM 1. The utility model provides a holographic projection arrangement of multi-media, includes connecting plate (1), lower extreme block at connecting plate (1) four corners inside spliced pole (2) and four corners bottom fixed connection post (2) annular roof (3), its characterized in that: the novel glass plate is characterized in that a clamping ring block (4) and an upper glass plate (12) are sequentially fixed at the bottom of the annular top plate (3), a clamping plate (11) is arranged on the inner side of the clamping ring block (4), an inclined glass plate (13) with a 45-degree inclined angle is arranged at the bottom of the upper glass plate (12), the adjacent inclined glass plates (13) are mutually fixed to form an inverted conical table structure, and the inclined glass plates (13) are all fixed in the middle of the upper surface of the connecting bottom plate (1).



N9804

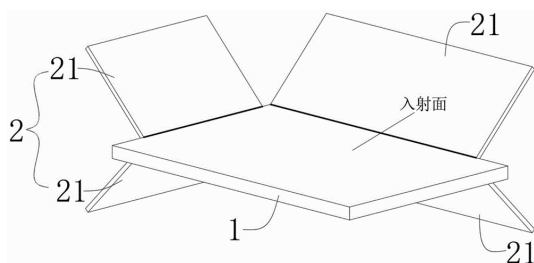
CN219957969U

Priority Date: 23/02/2021

JINGMEN CITY DREAM EXPLORATION TECHNOLOGY

TRANSMISSION TYPE GEOMETRIC HOLOGRAPHIC SCREEN WITH OPENING ANGLE

The utility model relates to the technical field of optical display, and discloses a transmission type geometric holographic screen with an opening angle, which comprises a transmission type geometric holographic screen, wherein at least one group of opening angle lens groups are arranged along the periphery of the edge of the transmission type geometric holographic screen, and the opening angle lens groups are used for reflecting partial light exceeding the edge of the transmission type geometric holographic screen onto the transmission type geometric holographic screen and participating in imaging through optical conversion of the transmission type geometric holographic screen; each set of angle-opening lens group consists of a pair of angle-opening lenses, and the two angle-opening lenses are respectively positioned at one side of an incident surface and an emergent surface of the transmission type geometric holographic screen; transmission geometryThe horizontal projection area of the holographic screen is S_1 The horizontal projection area of all the angle mirrors on the incident surface side or the emergent surface side of the transmission type geometric holographic screen is S_2 , S_1 And S_2 The unit is mm^2 The method comprises the following steps:the utility model can realize the remarkable increase of the display window by adopting relatively small cost, and can also increase the mechanical strength and the stability of the transmission type geometric holographic screen.



CLAIM 1. The utility model provides a take angle transmission type geometric holographic screen, includes transmission type geometric holographic screen (1), its characterized in that: at least one group of angle-tensioning lens groups (2) are arranged along the periphery of the edge of the transmission type geometric holographic screen (1), and the angle-tensioning lens groups (2) are used for reflecting partial light exceeding the edge of the transmission type geometric holographic screen (1) to the transmission type geometric holographic screen (1) and participating in imaging through optical conversion of the transmission type geometric holographic screen (1); each set of angle-opening lens group (2) consists of a pair of angle-opening lenses (21), and the two angle-opening lenses (21) are respectively positioned on one side of an incident surface and an emergent surface of the transmission type geometric holographic screen (1); the horizontal projection area of the transmission type geometric holographic screen (1) is S_1 The horizontal projection area of all the angle-expanding mirrors (21) on the incident surface side or the emergent surface side of the transmission type geometric holographic screen (1) is S_2 , S_1 And S_2 The unit is mm^2 The method comprises the following steps:

N9806

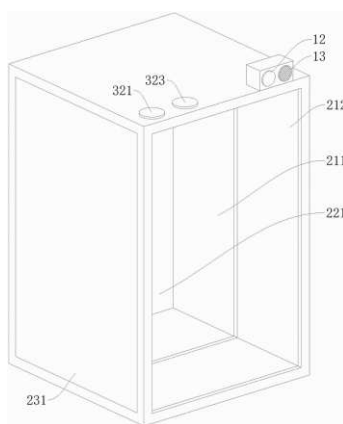
CN117095575

Priority Date: 02/06/2023

XIAMEN QIYI TECHNOLOGY

LEARNING MACHINE BASED ON HOLOGRAPHIC DISPLAY

The application relates to a learning machine based on holographic display, wherein a display device of the learning machine is composed of a holographic display unit, a background display unit and a touch control unit, wherein polarized transparent glass of the holographic display unit is arranged on the front side of a learning machine shell, a display screen of the background display unit is arranged on the rear side of the shell, and students/infants can see the display screen after penetrating the polarized transparent glass and the holographic transparent screen of the holographic display unit, so that the students/infants can keep a certain distance from the display screen, and the purpose of protecting eyesight is achieved. Meanwhile, the virtual character is displayed on the holographic transparent screen, the background corresponding to the virtual character is displayed on the intelligent display device, and the text of the learning content is displayed on the touch screen. According to the application, the virtual character and the background video are in front-back correspondence, and the text content is displayed through the touch screen, so that the learning is more apparent, and the learning interest of the learning machine is improved.



CLAIM 1. The learning machine based on holographic display comprises a shell, a main control device, a display device and a sound box, wherein the main control device, the display device and the sound box are arranged on the shell, and the main control device is connected with the display device and the sound box and controls the display device and the sound box; the main control device comprises a controller, a communication module and a control panel, wherein the controller is respectively connected with the control panel and the communication module; the control panel is provided with a power control key and a volume control key; the power control key is used for starting or stopping the power of the learning machine, and the volume control key is used for controlling the playing volume of the sound equipment; the method is characterized in that: the display device comprises a holographic display unit, a background display unit and a touch display unit, wherein the holographic display unit comprises polarized transparent glass and a holographic transparent screen, the polarized transparent glass is arranged on one side of the shell, and the side is defined as the front side of the shell; the holographic transparent screen is arranged in the shell and is positioned behind the polarized transparent glass; the touch control unit comprises at least one touch control screen, the touch control screen is arranged on the left side or the right side of the shell, and the touch control surface of the touch control screen faces outwards; the background display unit and the shell are of a fixed structure, the background display unit is a display screen, and the display screen is arranged at the rear side of the shell and has a forward display surface; the display screen is seen after passing through the polarized transparent glass and the holographic transparent screen of the holographic display unit; the main control device comprises a controller, a storage module and a control panel, wherein the storage module and the control panel are connected with the controller, and the controller is connected with the holographic transparent screen, the display screen and the touch screen; the control panel is provided with a power supply control key; the storage module is used for storing a background material library, a holographic material library and a touch screen material library, wherein virtual character videos are stored in the holographic material library, text videos are stored in the touch screen material library, and background videos are stored in the background material library; at this time, the user sees the video of the virtual character playing on the holographic transparent screen through the polarized transparent glass to deduct the learning content, hears the learning content played by the sound, and sees the background content synchronously played by the display screen of the background display unit and the text content synchronously displayed by the touch screen through the holographic transparent screen. The user sees the virtual character learning content on the holographic transparent screen through the polarized transparent glass, sees the background content synchronously played by the display screen and the text content synchronously displayed by the touch screen through the holographic transparent screen.

N9807

CN117087545

**CHONGQING SAILISI NEW ENERGY AUTOMOBILE DESIGN
INSTITUTE**

Priority Date: 28/09/2023

WORKING METHOD AND DEVICE OF HOLOGRAPHIC ELECTRONIC REARVIEW MIRROR SYSTEM

The application provides a working method and a device of a holographic electronic rearview mirror. The method comprises the following steps: receiving a rearview picture and a side view picture; extracting matching feature points in the overlapping area of the rearview picture and the side-looking picture so as to determine the mapping relation between the rearview picture and the side-looking picture according to the matching feature points; splicing the back view picture and the side view picture by using a preset algorithm according to the mapping relation to obtain a holographic image; the hologram is transmitted to a display to cause the display to display the hologram. The application realizes that the rearview picture and the side view picture acquired by the camera are fused to generate the holographic image so as to create a more comprehensive driving visual field. The method is beneficial to improving the perception capability of drivers and reducing blind areas, thereby improving the driving safety.

CLAIM 1. A method of operating a holographic electronic rear view mirror system, the holographic electronic rear view mirror system comprising a camera, a display and a controller: the camera comprises a rear-view camera and a side-view camera; the rearview camera is used for collecting a rearview picture of the target vehicle; the side-looking camera is used for collecting side-looking pictures of the target vehicle; the method is applied to a controller, and comprises the following steps: receiving the rear view picture and the side view picture; extracting matching feature points in an overlapping area of the rearview picture and the side-looking picture to determine a mapping relation between the rearview picture and the side-looking picture according to the matching feature points; Splicing the rearview picture and the side-looking picture by using a preset algorithm according to the mapping relation so as to obtain a holographic image; and sending the holographic image to the display so that the display displays the holographic image.

N9809

CN117079109

GUANGDONG XIAOTENG ZHIJIA TECHNOLOGY

Priority Date: 25/08/2023

IMMERSION TYPE HOLOGRAPHIC PROJECTION IMAGE PROCESSING METHOD AND VR SYSTEM FOR SMART HOME

The embodiment of the invention provides an immersion type holographic projection image processing method and a VR system for smart home, which are used for constructing an image sample of an image content pairing task based on the immersion type holographic projection image sample of an image content understanding task, combining an immersion type holographic projection image understanding network to train the image content understanding task, combining the immersion type holographic projection image understanding network according to the image sample of the image content pairing task to perform model learning of the image content pairing task, enabling the image content understanding task and the image content pairing task to share one immersion type holographic projection image understanding network and simultaneously perform model learning, thereby realizing combined learning of the immersion type holographic projection image understanding network, enabling the immersion type holographic projection image understanding network to learn not only the characteristics of the image content understanding task but also the characteristics of the image content pairing task, and further improving the image understanding accuracy of the immersion type holographic projection image understanding network.

CLAIM 1. The immersion type holographic projection image processing method for the smart home is characterized by comprising the following steps of: acquiring an immersive holographic projection image sample of an image content understanding task of an intelligent home system, wherein the immersive holographic projection image sample of the image content understanding task represents training sample data configured to perform the image content understanding task of an immersive holographic projection image understanding network; constructing an image sample of an image content pairing task based on the immersive holographic projection image sample of the image content understanding task, wherein the image sample of the image content pairing task represents training sample data configured to perform the image content pairing task of the immersive holographic projection image understanding network; combining the immersive holographic projection image samples of the image content understanding task with the immersive holographic projection image understanding network to train the image content understanding task; and combining the immersive holographic projection image understanding network according to the image samples of the image content pairing task to perform model learning of the image content pairing task so as to complete model learning of the immersive holographic projection image understanding network.

N9810

CN117075739

Priority Date: 13/10/2023

SHENZHEN EUCLIDEON TECHNOLOGY

HOLOGRAPHIC SAND TABLE-BASED HOLOGRAPHIC DISPLAY METHOD AND RELATED DEVICE

The invention relates to the technical field of holographic display, and discloses a holographic display method and a related device based on a holographic sand table, which are used for improving the accuracy of holographic display based on the holographic sand table. Comprising the following steps: performing three-dimensional scene modeling on the target virtual scene to obtain a holographic display three-dimensional scene model; performing three-dimensional scene conversion to obtain an initial holographic image set; performing light wave propagation path analysis on the initial holographic image set to obtain a light wave propagation path set; performing light wave propagation simulation through the light wave propagation path set to obtain a light wave interference index set and a light wave diffraction index set; performing image error compensation on the initial holographic image set to obtain a target holographic image set; the method comprises the steps of collecting gesture data sent by a handle device held by a user, and collecting biological signals transmitted by glasses equipment worn by the user; and generating instructions on the gesture data and the biological signals to obtain a target instruction, and performing projection control on the target holographic image set to obtain a target holographic image.

N9812

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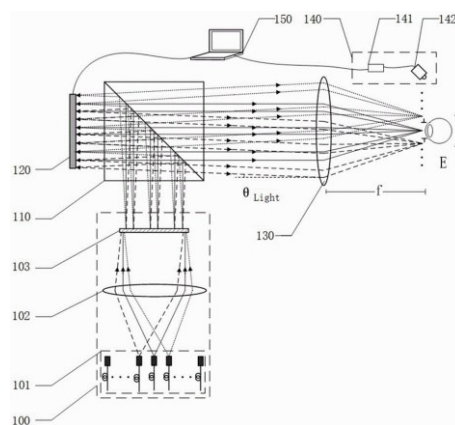
Priority Date: 29/08/2023

SHANGHAI UNIVERSITY

HOLOGRAPHIC NEAR-TO-EYE DISPLAY DEVICE AND METHOD FOR LARGE-EYE PUPIL BOX

A holographic near-eye display device of a large eye pupil box comprises a structured light multi-angle illumination module, a beam splitter, a spatial light modulator, an ocular, an eye movement tracking system, a control system and the like, wherein the structured light modulator is used for splitting parallel light at different angles, then the spatial light modulator is jointly illuminated at corresponding intervals, the parallel light is modulated and diffracted by a calculation hologram on the spatial light modulator, and diffracted image light is converged through the ocular to form different viewpoints for human eyes to watch, so that the purpose of expanding the eye pupil box is achieved, when the pupil position of the human eye changes, three-dimensional scenes corresponding to the viewpoints can be seen at different viewpoints after the control system is rendered, and a plurality of viewpoints can simultaneously display different three-dimensional scenes, so that the use experience of viewers is expanded.

CLAIM 1. A holographic near-eye display device with large eye pupil box comprises a structured light multi-angle illumination module, a beam splitter, a spatial light modulator, an ocular lens, an eye movement tracking system and a control system, and is characterized in that, the structure light multi-angle illumination module comprises at least one light source and a structure light modulation device, and is used for modulating the light emitted by the light source, generating parallel waves with different angles and jointly illuminating different areas of the spatial light modulator at different angles and corresponding intervals; the beam splitter is used for reflecting plane waves with different angles generated by the structured light multi-angle illumination module to the spatial light modulator; the spatial light modulator is arranged on the light emitting side of the structured light multi-angle lighting module, is connected with the control system and is loaded with holograms, and the holograms are composed of sub holograms corresponding to parallel light of each angle and are used for spatially modulating and diffracting the incident parallel light of different angles; the ocular lens is used for converging the diffracted light with image information at different angles to form different viewpoints for the human eyes to observe the virtual image at the corresponding viewpoints, and the distance between the adjacent viewpoints meets the following conditions: $f \cdot (\tan \theta_n - \tan \theta_{n-1}) \geq E$ wherein f is the focal length of the eyepiece, θ_n and θ_{n-1} respectively forming included angles between two adjacent beams of light and the optical axis of the ocular, wherein E is the pupil diameter of the human eye; the eye movement tracking system is connected with the control system and is used for tracking the central position of the pupil of the human eye; and the control system loads a required hologram on the spatial light modulator according to the pupil position movement information of the human eye, which is acquired by the eye movement tracking system, and realizes that the human eye can see three-dimensional images at different viewpoints through rendering.



N9817

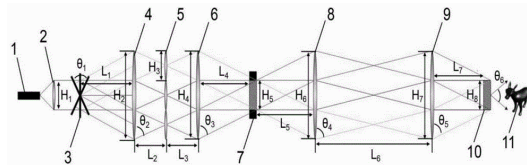
CN117031906

Priority Date: 07/09/2023

BEIHANG UNIVERSITY OF AERONAUTICS & ASTRONAUTICS

METHOD FOR WIDENING HOLOGRAPHIC FIELD ANGLE BASED ON MULTI-ANGLE OPTICAL INTEGRAL LIGHTING SYSTEM

A method for widening holographic field of view based on multi-angle optical integral lighting system includes utilizing scanning galvanometer to control input angle of light source and matching relay optical system to change angle of incident light in real time so as to expand field of view of holographic image, reducing noise point of holographic image and realizing quick design and construction of holographic video system with high quality.



CLAIM 1. A method for widening the angle of view of a hologram based on a multi-angle optical integration illumination system, comprising illuminating a spatial light modulator in a holographic image generation and collection system with the multi-angle optical integration illumination system, disposing a scanning galvanometer between a front 4f relay optical system and a collimator lens in the multi-angle optical integration illumination system, and changing the angle of illumination light by the angle change of the scanning galvanometer so that the front 4f relay optical system collects incident light sources of respective angles and transmits the incident light to the illumination light incident side of the spatial light modulator.

N9819

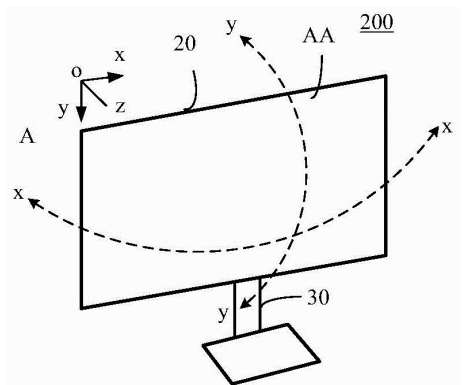
CN117031775

Priority Date: 30/05/2023

TIANMA

DISPLAY DEVICE, CONTROL METHOD THEREOF AND HOLOGRAPHIC 3D DISPLAY SCREEN

The invention discloses a display device, a control method thereof and a holographic 3D display screen, wherein the display device comprises a display module and an adjusting module; the deflection device of the display module is used for moving the image at least along a first direction; the actuation means of the adjustment module moves the image at least in the second direction by moving or rotating the display module. The actuating device is additionally arranged in the display device, so that the deflection device is controlled to follow the moving direction of human eyes, and the image is moved along the moving direction of the human eyes in the direction of at least part of components of the plane of the deflection device; and meanwhile, the actuating device is controlled to move or rotate the display module, the image is moved in at least part of component directions of the plane of the deflection device along the moving direction of the human eyes in the same direction or different directions, when a user moves in a larger moving range, the deflection range of the deflection device is compensated by the actuating device, and the diffraction effect of the deflection device when deflecting the image in a large visual angle is ensured, so that the display effect is improved.



CLAIM 1. A display device, characterized in that the display device comprises a display module and an adjustment module; the display module includes a deflection device for moving an image at least along a first direction; The adjustment module comprises actuation means for moving the image at least in a second direction by moving or rotating the display module; the first direction is the same as or different from the second direction; the first direction and the second direction are respectively parallel to a first plane, and the first plane is parallel to the plane where the deflection device is located.

N9821

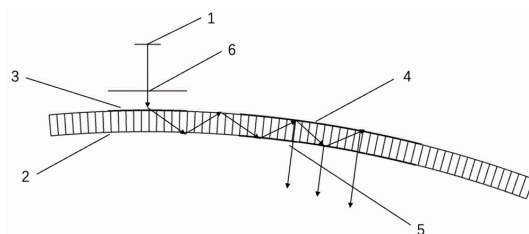
CN117031617

Priority Date: 24/08/2023

ZHEJIANG UNIVERSITY

CURVED SURFACE HOLOGRAPHIC WAVEGUIDE COMBINER WITH TWO-DIMENSIONAL PUPIL EXPANSION AND APPLICATION THEREOF

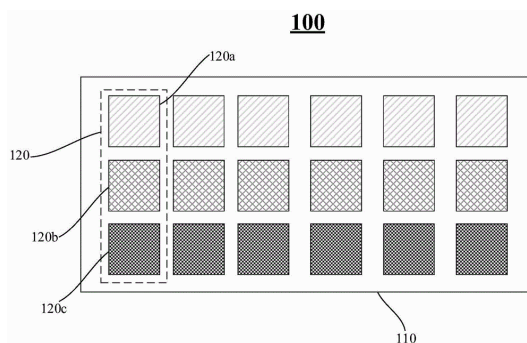
The invention discloses a curved surface holographic waveguide combiner with a two-dimensional pupil expansion, which comprises an image source, a curved surface waveguide, a coupling-in holographic grating, a turning holographic grating and a coupling-out holographic grating, wherein light rays emitted by the image source are subjected to total reflection in the curved surface waveguide after being reacted with the coupling-in holographic grating, are propagated in the curved surface waveguide, and are respectively subjected to interaction with the turning holographic grating and the coupling-out holographic grating and then are incident into the field of vision of an observer; the coupling-in holographic grating, the turning holographic grating and the coupling-out holographic grating are all of curved structures and have the same curvature at the joint of the coupling-in holographic grating, the turning holographic grating and the coupling-out holographic grating and the curved waveguide. The invention also discloses application of the curved surface holographic waveguide combiner with the two-dimensional pupil expansion in head-up display HUD. The curved surface holographic waveguide combiner provided by the invention can realize the display effect of a large exit pupil range, and can be directly combined with the front windshield of an automobile.



CLAIM 1. The curved surface holographic waveguide combiner is characterized by comprising an image source, a curved surface waveguide, a coupling-in holographic grating, a turning holographic grating and a coupling-out holographic grating, wherein light rays emitted by the image source and the coupling-in holographic grating interact and then are subjected to total reflection in the curved surface waveguide, are propagated in the curved surface waveguide, and are respectively interacted with the turning holographic grating and the coupling-out holographic grating and then are incident into the field of view of an observer; the coupling-in holographic grating, the turning holographic grating and the coupling-out holographic grating are all of curved structures and have the same curvature at the joint of the coupling-in holographic grating, the turning holographic grating and the coupling-out holographic grating and the curved waveguide.

VOLUME HOLOGRAPHIC GRATING AND PREPARATION METHOD THEREOF, OPTICAL WAVEGUIDE STRUCTURE AND NEAR-EYE DISPLAY DEVICE

The application provides a volume holographic grating, a preparation method thereof, an optical waveguide structure and a near-eye display device, which are beneficial to improving color cast and rainbow effect. The volume holographic grating comprises a photosensitive base layer and a plurality of grating units arranged on the photosensitive base layer in an array mode, and the grating units comprise a first sub-grating, a second sub-grating and a third sub-grating. The first sub-grating is formed by interference of first coherent light and second coherent light, and an included angle between the first coherent light and a normal line of the photosensitive substrate is more than or equal to 53 degrees and less than or equal to 60 degrees; the second sub-grating is formed by interference of third coherent light and fourth coherent light, and an included angle between the third coherent light and the normal line of the photosensitive substrate is more than or equal to 48 degrees and less than or equal to 70 degrees; the third sub-grating is formed by interference of fifth coherent light and sixth coherent light, and an included angle between the fifth coherent light and the normal line of the photosensitive base layer is more than or equal to 45 degrees and less than or equal to 80 degrees.



CLAIM 1. The volume holographic grating is characterized by comprising a photosensitive base layer and a plurality of grating units which are arranged on the photosensitive base layer in an array manner, wherein each grating unit comprises a first sub-grating, a second sub-grating and a third sub-grating, the first sub-grating is used for diffracting red light, the second sub-grating is used for diffracting green light, and the third sub-grating is used for diffracting blue light; The first sub-grating is formed by interference of first coherent light and second coherent light, an included angle between the first coherent light and the normal line of the photosensitive base layer is more than or equal to 53 degrees and less than or equal to 60 degrees, and the second coherent light is perpendicular to the normal line of the photosensitive base layer; the second sub-grating is formed by interference of third coherent light and fourth coherent light, an included angle between the third coherent light and the normal line of the photosensitive base layer is more than or equal to 48 degrees and less than or equal to 70 degrees, and the fourth coherent light is perpendicular to the normal line of the photosensitive base layer; the third sub-grating is formed by interference of fifth coherent light and sixth coherent light, an included angle between the fifth coherent light and the normal line of the photosensitive base layer is larger than or equal to 45 degrees and smaller than or equal to 80 degrees, and the sixth coherent light is perpendicular to the normal line of the photosensitive base layer.

HOLOGRAPHIC POLYMER DISPERSED LIQUID CRYSTAL MATERIAL AND APPLICATION THEREOF

The invention discloses a holographic polymer dispersed liquid crystal material and application thereof, wherein the holographic polymer dispersed liquid crystal material comprises a liquid crystal composition, acrylic ester polymerizable monomers, a photoinitiator and a co-initiator; the liquid crystal composition comprises compounds shown in the following formulas I-III, and the acrylic polymerizable monomer comprises a trifunctional polymerizable monomer and a compound shown in the following formula IV. According to the holographic polymer dispersed liquid crystal material, the liquid crystal composition with a specific structural formula and the polymerizable monomer are selected, so that the prepared holographic polymer dispersed liquid crystal material has excellent performance, and the prepared volume holographic grating has high diffraction efficiency and low haze, can be switched between a holographic state and a transparent state, and can meet the application requirements of the volume holographic optical waveguide.



CLAIM 1. A holographic polymer dispersed liquid crystal material, which is characterized by comprising a liquid crystal composition, an acrylic polymerizable monomer, a photoinitiator and a co-initiator; the liquid crystal composition comprises compounds shown in the following formulas I-III, and the acrylic polymerizable monomer comprises a trifunctional polymerizable monomer and a compound shown in the following formula IV: a compound of formula i: ; a compound of formula ii: ; a compound of formula iii: ; a compound of formula iv: ; wherein R is 1 And R is 3 Independent representations $\text{R}_1, \text{R}_2, \text{R}_3$; An alkyl group having 1 to 7 carbon atoms, an alkoxy group having 1 to 7 carbon atoms, an alkenyl group having 2 to 7 carbon atoms, an alkenyloxy group having 3 to 7 carbon atoms, wherein at least one hydrogen atom may be substituted with a fluorine atom; R 2 representation of $\text{R}_2, \text{R}_3, \text{R}_4$; An alkyl group having 1 to 7 carbon atoms, an alkoxy group having 1 to 7 carbon atoms, wherein at least one hydrogen atom may be substituted with a fluorine atom; representation $\text{R}_2, \text{R}_3, \text{R}_4$; X represents F, CF₃, OCF₃; L 1 ~L 4 Represents a fluorine atom or a hydrogen atom; n 1, n 2 and n 3 Each independently represents 1 or 2, and when n 1 When the number of the particles is 2, the particles are mixed, may be the same or different, when n 2 When 2 is, L 1 May be the same or different, when n 3 When 2 is, L 4 May be the same or different; Sp 1, Sp 2 each independently represents a single bond or a linear alkyl group having 1 to 6 carbon atoms, at least one or more-CH(s) in the linear alkyl group having 1 to 6 carbon atoms 2 -may be substituted by-O-, -COO-, or-c=c-; Y 1 represents a fluorine atom, a chlorine atom, an alkyl group having 1 to 7 carbon atoms, an alkoxy group having 1 to 7 carbon atoms, an alkenyl group having 2 to 6 carbon atoms, an alkenyloxy group having 2 to 6 carbon atoms or a cycloalkyl group having 3 to 6 carbon atoms; p represents 1, 2, 3, 4 or 5; q represents 0, 1, 2, 3 or 4, and when p is 2, 3, 4 or 5, Y 1 And q may be the same or different.

N9826

CN117012121

Priority Date: 15/08/2023

SHENZHEN ZHONGRUN OPTOELECTRONICS TECHNOLOGY

HOLOGRAPHIC DISPLAY DEVICE WITH PROTECTION FUNCTION

The invention relates to the technical field of holographic display, in particular to a holographic display device with a protection function, which comprises a display stand; the top side of the display stand is provided with a dustproof structure, the dustproof structure comprises an exhaust pipe, an air inlet pipe is arranged in the display stand, the end part of the air inlet pipe is fixedly connected with a sealing sleeve, the other end of the sealing sleeve is rotationally connected with the exhaust pipe, a torsion spring is fixedly connected between the exhaust pipe and the display stand, an air inlet hole is formed in the exhaust pipe, the radian of the air inlet hole is equal to that of the air inlet hole, a diversion trench is fixedly connected to the side surface of the exhaust pipe, and the side surface of the diversion trench is in contact with the display stand; the dustproof structure is connected with the angle adjusting structure; can reduce holographic equipment through dustproof construction and be infected with the dust, guarantee transparent medium surface's cleanliness factor, can adjust the angle that the air current kept apart through angle modulation structure, provide best dustproof effect.

CLAIM 1. A hologram display device having a protective function, comprising: a display stand (1); the top side of show stand (1) is equipped with dustproof construction (2), dustproof construction (2) include blast pipe (201), the internally mounted of show stand (1) has intake pipe (205), the tip fixedly connected with seal cover (204) of intake pipe (205), the other end rotation of seal cover (204) is connected with blast pipe (201), fixedly connected with torsional spring (206) between blast pipe (201) and show stand (1), air inlet hole (203) have been seted up on blast pipe (201), the radian of air inlet hole (203) is 90 degrees, blast pipe (201) side fixedly connected with guiding gutter (202), the side of guiding gutter (202) is inconsistent with show stand (1); angle modulation structure (3), dustproof construction (2) are connected with angle modulation structure (3).

N9827

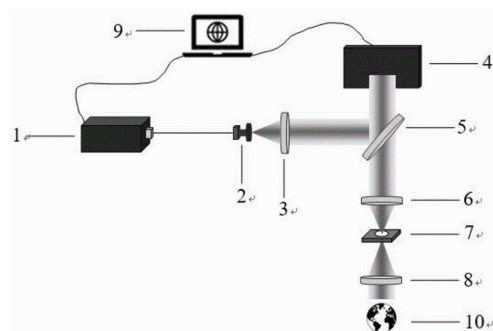
CN117008440

Priority Date: 23/08/2023

BEIHANG UNIVERSITY OF AERONAUTICS & ASTRONAUTICS

COLOR SPHERICAL HOLOGRAPHIC DISPLAY SYSTEM BASED ON CONFORMAL DIFFRACTION PRINCIPLE

The invention provides a color spherical holographic display system based on a conformal diffraction principle, which comprises a color laser, a beam expander, a lens I, a spatial light modulator, a half mirror, a lens II, a diaphragm, a lens III and a computer. Wherein, the color laser forms a collimated beam after passing through the beam expander and the lens I. The computer loads a color spherical hologram generated based on the principle of conformal diffraction onto the spatial light modulator. The incident collimated light beam irradiates the spatial light modulator after passing through the half mirror, the light wave modulated by the spatial light modulator is diffracted in space to form a holographic 3D reproduction image with a natural spherical effect after passing through the lens II, the diaphragm and the lens III, and the diaphragm is used for filtering stray light. A computer is used in the system to synchronously control the spatial light modulator and the color laser. When the color spherical hologram is loaded to the spatial light modulator, the three light beams of red, green and blue respectively irradiate the spherical holograms of corresponding colors, and finally the color spherical hologram 3D reproduction image is observed.



CLAIM 1. The color spherical holographic display system based on the conformal diffraction principle is characterized by comprising a color laser, a beam expander, a lens I, a spatial light modulator, a half mirror, a lens II, a diaphragm, a lens III and a computer; the color laser emits red light, green light and blue light according to a time sequence, a collimated light beam is formed after passing through a beam expander and a lens I, a computer loads a color spherical hologram generated based on a conformal diffraction principle onto a spatial light modulator, the incident collimated light beam irradiates the spatial light modulator after passing through a half mirror, light waves modulated by the spatial light modulator are diffracted in space to form a holographic 3D reproduction image with a natural spherical effect after passing through a lens II, a diaphragm and a lens III, the diaphragm is used for filtering stray light, the spatial light modulator and the color laser are synchronously controlled by the computer, and when the color spherical hologram is loaded onto the spatial light modulator, the light beams with three colors of red, green and blue irradiate the spherical hologram with corresponding colors respectively, and finally the color spherical hologram 3D reproduction image is observed.

N9828

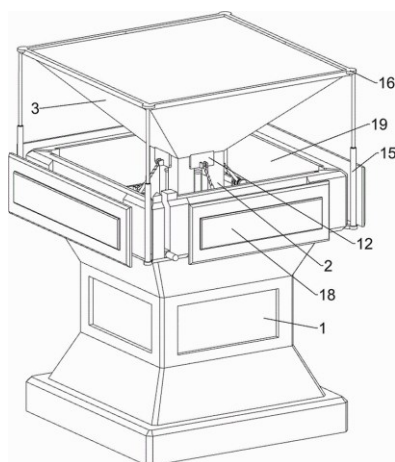
CN117008405

Priority Date: 07/10/2023

CHANGCHUN VOCATIONAL INSTITUTE OF TECHNOLOGY

THREE-DIMENSIONAL HOLOGRAPHIC DEVICE USING MULTIMEDIA TECHNOLOGY

The invention discloses a three-dimensional holographic device utilizing a multimedia technology, which relates to the field of holographic projection and comprises a base, wherein an imaging mirror surface is arranged at the top of the base, a connecting frame with the same number of side edges as the side edges of the imaging mirror surface is slidably connected in the base, a first telescopic component with the same number of side edges as the side edges of the imaging mirror surface is arranged on the connecting frame, and a calibration block is fixedly connected at the telescopic end of the first telescopic component. According to the invention, the calibration block is arranged, when the position of the imaging mirror surface is deviated, the first telescopic component and the calibration block are driven to move upwards through the connecting frame, and the four bottom angles of the imaging mirror surface are calibrated, so that the bottom angles of the imaging mirror surface are matched with the vertex angles of the projector, and the imaging mirror surface can accurately project the picture of the projector.



CLAIM 1. Utilize three-dimensional holographic device of multimedia technology, a serial communication port, including base (1), mapping instrument (2) are installed at base (1) top, imaging mirror (3) have been placed at mapping instrument (2) top, imaging mirror (3) are constituted by transparent tetrahedron and the transparent top surface at top of side, sliding connection has side quantity with link (4) that mapping instrument (2) side quantity is unanimous in base (1), link (4) rigid coupling has handle (5), handle (5) with base (1) sliding connection, link (4) be provided with first telescopic subassembly (6) that mapping instrument (2) side angle quantity is unanimous, the telescopic end rigid coupling of first telescopic subassembly (6) has calibration piece (7), base (1) are provided with and are used for right imaging mirror (3) side position is restricted stabilizing subassembly, base (1) are provided with be used for right imaging mirror (3) upper and lower position carries out restriction subassembly.

N9832

CN116985712

Priority Date: 11/08/2023

GREAT WALL MOTOR

HOLOGRAPHIC PROJECTION CONTROL METHOD AND DEVICE, STORAGE MEDIUM AND VEHICLE

The embodiment of the application provides a holographic projection control method, a holographic projection control device, a storage medium and a vehicle, which belong to the technical field of vehicle control. According to the embodiment of the application, the influence of the vehicle window, the vehicle door and other vehicles on the holographic projection image is comprehensively considered, so that the holographic projection image can be adaptively adjusted, the holographic projection image can be effectively observed by a user in various scenes, and the observation experience of the user is effectively improved.

CLAIM 1. A holographic projection control method, the method comprising: acquiring the height of the vehicle window at two sides of the cockpit, the opening degree of the vehicle door and/or the position information of other vehicles; determining a target adjustment strategy for any one of two sides of the cockpit based on window height, door opening and/or position information of the side; and adjusting the holographic projection image at the side according to the target adjustment strategy.

N9833

CN116977585

Priority Date: 02/08/2023

CHONGQING DIWUWEI TECHNOLOGY

HOLOGRAPHIC PROJECTION METHOD

The application belongs to the technical field of 3D sand table maps, and particularly discloses a holographic projection method, which comprises the following steps: importing the three-dimensional map into control equipment, and analyzing the three-dimensional map by the control equipment to obtain the three-dimensional coordinates of each area position; the control equipment analyzes the height distance in the three-dimensional coordinates of each area position to obtain a reference surface, and obtains the relative height of each area position on the map relative to the reference surface according to the reference surface; the control device is internally provided with the highest display height, and can automatically scale, and if the scaled maximum relative height exceeds the highest display height, the scaling is adjusted until the scaled maximum relative height does not exceed the highest display height; the three-dimensional coordinates are scaled according to the adjusted scaling; the driving mechanism drives the dot matrix needle unit to move; the projection device projects on a stereoscopic sand table.

CLAIM 1. A holographic projection method, characterized by: the device is applied to a holographic projection system, and the holographic projection system comprises a control device, a three-dimensional sand table and projection devices, wherein the three-dimensional sand table comprises a driving mechanism and a plurality of dot matrix needle units, and the driving mechanism is used for driving the dot matrix needle units to lift; the holographic projection method comprises the following steps: analyzing the three-dimensional map: importing a three-dimensional map to be projected into control equipment, and analyzing the three-dimensional map by the control equipment to obtain the three-dimensional coordinates of each region position; analyzing data: the control equipment obtains the relative height of each area position on the map relative to the reference plane according to the reference plane; determining the ratio: the control equipment is internally provided with the maximum movement height of the sand table, and can automatically scale, and if the scaled maximum relative height exceeds the maximum movement height, the scaling is adjusted until the scaled maximum relative height does not exceed the maximum movement height; the three-dimensional coordinates are scaled according to the adjusted scaling; control the three-dimensional sand table: the control equipment determines the corresponding dot matrix units and the height data of the dot matrix units according to the three-dimensional coordinates after the positions of the areas are zoomed, and the driving mechanism drives the corresponding dot matrix needle units to move according to the height data and realizes the height change of the dot matrix units; controlling the projection device: the projection device projects on a stereoscopic sand table.

N9835

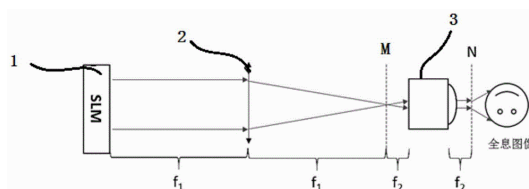
CN116974170

Priority Date: 15/08/2023

UNIVERSITY OF SCIENCE & TECHNOLOGY OF CHINA

SPATIAL LIGHT MODULATION SYSTEM, METHOD AND HOLOGRAPHIC IMAGE GENERATION METHOD

A spatial light modulation system, method and method of generating a holographic image, the spatial light modulation system comprising: the spatial light modulator is suitable for modulating the phase of a laser signal from the outside and outputting a modulated planar light field; the first lens unit and the second lens unit are used for sequentially carrying out Fourier transformation on the planar light field output by the spatial light modulation so as to realize the scaling of the planar light field at the second focal plane of the second lens unit.



CLAIM 1. A spatial light modulation system comprising: the spatial light modulator is suitable for modulating the phase of a laser signal from the outside and outputting a modulated planar light field; the spatial light modulator is positioned on a first focal plane of the first lens unit, a second focal plane of the first lens unit is overlapped with the first focal plane of the second lens unit, and the first lens unit and the second lens unit sequentially perform Fourier transformation on a planar light field output by the spatial light modulator so as to realize scaling of the planar light field at the second focal plane of the second lens unit.

N9834

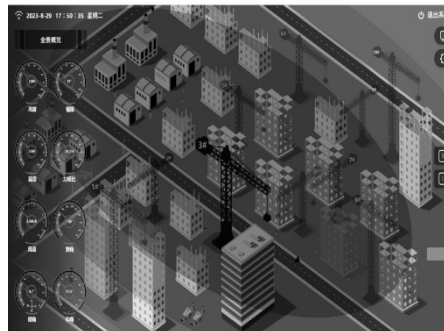
CN116977183

Priority Date: 22/09/2023

ADVANCED INSTITUTE OF INFORMATION TECHNOLOGY AIIT
PEKING UNIVERSITY | HANGZHOU WEIMING XINKE TECHNOLOGY

INTELLIGENT CONSTRUCTION SITE HOLOGRAPHIC IMAGE DISPLAY SPLICING METHOD AND SYSTEM USING SAME

The application relates to an intelligent building site holographic image display splicing method and a system using the same. The method comprises the following steps: obtaining holographic images of a plurality of groups of tower crane scenes; taking any two holographic images in the holographic images of each group of tower crane scenes as a first spliced image to be displayed and a second spliced image to be displayed respectively, and storing the first spliced image to be displayed and the second spliced image to be displayed in a first spatial light modulator and a second spatial light modulator respectively; performing diffraction operation on all pixels in a first spliced image to be displayed by using a first spatial light modulator, performing diffraction operation on all pixels in a second spliced image to be displayed by using a second spatial light modulator, and displaying a first three-dimensional reconstruction image corresponding to the first spliced image to be displayed and a second three-dimensional reconstruction image corresponding to the second spliced image to be displayed; and displaying and splicing the first three-dimensional reconstruction image and the second three-dimensional reconstruction image. The application can obtain accurate and clear three-dimensional splicing effect and is easy to identify the abnormality in the construction site.



CLAIM 1. An intelligent construction site holographic image display splicing method is characterized by comprising the following steps: disposing holographic cameras in a plurality of areas of the target intelligent construction site, and adjusting the distance between adjacent holographic cameras disposed in the same horizontal plane and the same vertical plane of each area according to different scenes corresponding to each area; shooting the target intelligent building site from a first moment to a second moment through all deployed holographic cameras to obtain an initial holographic image set of the target intelligent building site; classifying all images in an initial holographic image set of the target intelligent building site to obtain holographic images of a plurality of groups of tower crane scenes, wherein the holographic images of each group of tower crane scenes comprise at least two holographic images at different moments, and at least one of a big arm, a slewing mechanism, a trolley, a lifting hook and a winch is shot on the holographic images at each different moment; taking any two holographic images in the holographic images of each group of tower crane scenes as a first spliced image to be displayed and a second spliced image to be displayed respectively, and storing the first spliced image to be displayed and the second spliced image to be displayed in a first spatial light modulator and a second spatial light modulator respectively; performing diffraction operation on all pixels in the first spliced image to be displayed by using the first spatial light modulator, performing diffraction operation on all pixels in the second spliced image to be displayed by using the second spatial light modulator, and displaying a first three-dimensional reconstruction image corresponding to the first spliced image to be displayed and a second three-dimensional reconstruction image corresponding to the second spliced image to be displayed; and displaying and splicing the first three-dimensional reconstruction image and the second three-dimensional reconstruction image.

N9836

CN116958353

Priority Date: 27/07/2023

SHENZHEN EUCLIDEON TECHNOLOGY

HOLOGRAPHIC PROJECTION METHOD BASED ON DYNAMIC CAPTURE AND RELATED DEVICE

The invention relates to the field of artificial intelligence, and discloses a holographic projection method and a related device based on dynamic capture, which are used for improving the accuracy of dynamic capture and further improving the projection effect of holographic projection. The method comprises the following steps: extracting feature data from the dynamic data of the conference scene to obtain character geometry and texture feature data and motion trail feature data, and performing audio segmentation to obtain audio data of the conference scene; extracting depth information to obtain target depth information, and reconstructing geometric shapes and textures to generate an initial presenter model; performing feature enhancement processing to obtain a target presenter model, and performing dynamic fusion to obtain presenter dynamic fusion data; analyzing the light field information to obtain target light field data; performing holographic projection code conversion to generate holographic projection code data; and carrying out projection rendering and interaction control on the holographic projection coding data based on the conference scene audio data to generate holographic projection conference interaction data.

CLAIM 1. A holographic projection method based on dynamic capture, characterized in that the holographic projection method based on dynamic capture comprises: capturing dynamic data of a target speaker through a preset conference terminal to obtain conference scene dynamic data, and recognizing facial features of the target speaker to obtain target facial feature data; extracting feature data of the dynamic data of the conference scene to obtain character geometry and texture feature data and motion trail feature data, and performing audio segmentation on the dynamic data of the conference scene to obtain audio data of the conference scene; extracting depth information from the figure geometry and texture feature data to obtain target depth information, and reconstructing geometry and texture according to the target depth information to generate an initial presenter model; Performing feature enhancement processing on the initial presenter model according to the target facial feature data to obtain a target presenter model, and performing dynamic fusion on the target presenter model according to the motion trail feature data to obtain presenter dynamic fusion data; performing light field information analysis on the conference scene dynamic data to obtain target light field data; carrying out holographic projection code conversion on the dynamic fusion data of the presenter based on the target light field data to generate holographic projection code data; and carrying out projection rendering and interaction control on the holographic projection coding data based on the conference scene audio data to generate holographic projection conference interaction data.

N9841

CN116943257

Priority Date: 28/08/2023

3D NEW CULTURE

VIRTUAL-REAL COMBINED HOLOGRAPHIC STAGE IMAGING METHOD, MEDIUM AND HOLOGRAPHIC STAGE IMAGING SYSTEM

The invention relates to a virtual-real combined holographic stage imaging method, a medium and a holographic stage imaging system, wherein the virtual-real combined holographic stage imaging method comprises the steps of acquiring real-time position information of a performer on a performance stage; determining a real-time target display position of a three-dimensional virtual human body image to be generated on a preset display area according to the acquired real-time position information of the performer; generating a three-dimensional virtual human body image corresponding to the performer, and displaying the three-dimensional virtual human body image in a holographic manner at a real-time target display position of a preset display area; the real-time gesture data of the performer on the performance stage is collected, and the three-dimensional virtual human body image on the preset display area presents a virtual gesture synchronous with the performer, so that a spectator can watch the performance of the three-dimensional virtual human body image in an immersive manner, and the 'real' experience of the spectator is enhanced.

CLAIM 1. The virtual-real combined holographic stage imaging method is characterized by comprising the following steps of: acquiring real-time position information of a performer on a performance stage; determining a real-time target display position of a three-dimensional virtual human body image to be generated on a preset display area according to the acquired real-time position information of the performer; generating a three-dimensional virtual human body image corresponding to the performer, and displaying the three-dimensional virtual human body image in a holographic manner at a real-time target display position of a preset display area; and acquiring real-time posture data of the performer on the performance stage, and enabling the three-dimensional virtual human body image on the preset display area to present a virtual posture synchronous with the performer.

N9840

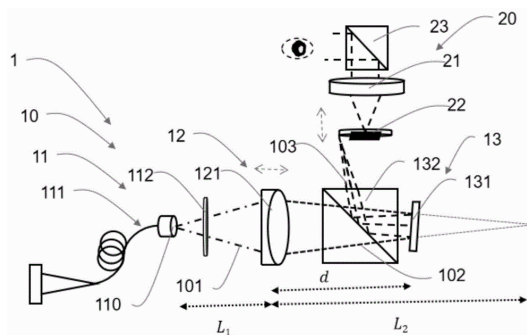
CN116953928

Priority Date: 20/04/2022

SUNNY OPTICAL ZHEJIANG RESEARCH INSTITUTE

NEAR-EYE HOLOGRAPHIC DISPLAY OPTICAL MACHINE, NEAR-EYE HOLOGRAPHIC DISPLAY EQUIPMENT AND NEAR-EYE HOLOGRAPHIC DISPLAY METHOD

The invention provides a near-eye holographic display optical machine, a near-eye holographic display device and a near-eye holographic display method, which can fully utilize optical paths, shorten the optical path length after emergent from a spatial light modulator, contribute to reducing the optical volume and meet the miniaturization requirement of the near-eye display device. The near-eye holographic display optical machine comprises a polarized illumination component, a beam-splitting modulation component and a lens component, wherein the polarized illumination component is used for emitting polarized illumination. The lens assembly is correspondingly disposed in the optical path between the polarized illumination assembly and the spectral modulation assembly. The beam-splitting modulation assembly includes a spatial light modulator and a beam-splitting prism correspondingly disposed in an optical path between the lens assembly and the spatial light modulator, the beam-splitting prism for transmitting the polarized illumination light to the spatial light modulator, the spatial light modulator for modulating the polarized illumination light into converging holographic image light for reflection back to the beam-splitting prism, the beam-splitting prism further for transmitting the converging holographic image light to an eyepiece display assembly.



CLAIM 1. The near-to-eye holographic display optical machine is used for projecting holographic image light to the ocular display component to carry out holographic display, and is characterized in that the near-to-eye holographic display optical machine comprises: a polarized illumination assembly for emitting polarized illumination light; a beam-splitting modulation component; and a lens assembly disposed in an optical path between the polarization illumination assembly and the spectral modulation assembly, respectively, for transmitting the polarized illumination light from the polarization illumination assembly to the spectral modulation assembly after passing through the lens assembly; the light splitting and modulating assembly comprises a spatial light modulator and a light splitting prism correspondingly arranged in a light path between the lens assembly and the spatial light modulator, wherein the light splitting prism is used for transmitting polarized illumination light transmitted through the lens assembly to the spatial light modulator, the spatial light modulator is used for modulating the polarized illumination light transmitted through the light splitting prism into converged holographic image light to be reflected back to the light splitting prism, and the light splitting prism is further used for transmitting the converged holographic image light modulated through the spatial light modulator to the eyepiece display assembly.

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

N9813

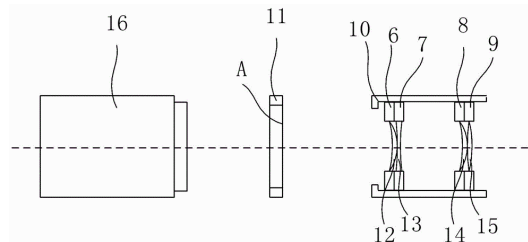
CN117075293

Priority Date: 17/10/2023

CHANNGCHUN CHANGGUANG ADVANCED OPTICS TECHNOLOGY

SUBMICRON-LEVEL MULTI-RING-BELT MULTILEVEL ALIGNMENT DETECTION DEVICE AND METHOD FOR CALCULATING HOLOGRAM

The device and the method for detecting the multi-level alignment of the submicron-level multi-ring belt of the calculation hologram belong to the technical field of optical detection adjustment, and solve the problems that the existing adjustment method is complex, the adjustment precision is low, and the adjustment of an optical system with a large caliber and a long light path cannot be realized. The interferometer, the calculation holographic element, the first lens, the second lens, the third lens and the fourth lens are sequentially arranged and coaxially arranged; the first adjusting mechanism is fixed at two ends of the first lens; the second adjusting mechanism is fixed at two ends of the second lens; the third adjusting mechanism is fixed at two ends of the third lens; the fourth adjusting mechanism is fixed at two ends of the fourth lens; the first adjusting mechanism, the second adjusting mechanism, the third adjusting mechanism and the fourth adjusting mechanism are all fixed in the lens barrel shell. The detection device realizes submicron-level high-precision adjustment and is not limited by the caliber of the lens group and the length of the optical system.



CLAIM 1. The submicron-level multi-ring belt multilevel alignment detection device for calculating the hologram is characterized by comprising a first adjustment mechanism (6), a second adjustment mechanism (7), a third adjustment mechanism (8), a fourth adjustment mechanism (9), a lens barrel shell (10), a calculation hologram element (11), a first lens (12), a second lens (13), a third lens (14), a fourth lens (15) and an interferometer (16); the interferometer (16), the calculation holographic element (11), the first lens (12), the second lens (13), the third lens (14) and the fourth lens (15) are sequentially arranged and coaxially placed; the first adjusting mechanism (6) is fixed at two ends of the first lens (12); the second adjusting mechanism (7) is fixed at two ends of the second lens (13); the third adjusting mechanism (8) is fixed at two ends of the third lens (14); the fourth adjusting mechanism (9) is fixed at two ends of the fourth lens (15); the first adjusting mechanism (6), the second adjusting mechanism (7), the third adjusting mechanism (8) and the fourth adjusting mechanism (9) are all fixed in the lens barrel shell (10).

N9814

CN117055318

Priority Date: 17/07/2023

ALPPO TECHNOLOGY

IMAGING METHOD OF HOLOGRAPHIC IMAGE, SYSTEM AND MAIN CONTROL EQUIPMENT THEREOF

The invention discloses an imaging method of a holographic image, which is applied to an imaging system of the holographic image, and comprises the steps of dividing a light beam emitted by a laser emitter to a sample to be imaged into a first light beam and a second light beam through a beam splitter; receiving the first light beam by using a spatial light modulator, and reflecting the first light beam to a camera according to a preset angle; controlling the camera to receive the first light beam and the second light beam, and generating a measurement image according to the first light beam and the second light beam; inversion and reconstruction are performed on the measurement image to obtain a holographic image of the sample to be imaged. The imaging method disclosed by the invention can solve the problem of slower imaging speed of the traditional DHM. In addition, the invention also discloses an imaging system and a main control device of the holographic image.

CLAIM 1. A method of imaging a holographic image, applied to an imaging system of a holographic image, the method of imaging a holographic image comprising: dividing a light beam emitted by a laser emitter to a sample to be imaged into a first light beam and a second light beam by a beam splitter; receiving the first light beam by using a spatial light modulator, and reflecting the first light beam to a camera according to a preset angle; controlling the camera to receive the first light beam and the second light beam, and generating a measurement image according to the first light beam and the second light beam; inverting and reconstructing the measurement image to obtain a holographic image of the sample to be imaged.

N9816

CN117054296

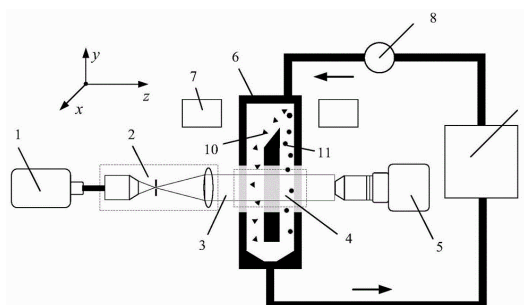
Priority Date: 16/08/2023

ZHEJIANG UNIVERSITY

OIL ABRASIVE PARTICLE DETECTION METHOD AND DEVICE BASED ON MICROSCOPIC HOLOGRAM AND MAGNETIC FIELD REGULATION

The invention discloses an oil abrasive particle detection method based on microscopic holography and magnetic field regulation, which comprises the following steps: the oil to be measured is divided into a ferromagnetic particle flow and a non-ferromagnetic particle flow under the action of a magnetic field and then enters a measuring area; the laser beam is shaped by the optical element and then enters the measuring area, and the laser beam is transmitted through the ferromagnetic particles and the nonferromagnetic particles to form holographic fringes and recorded as a particle hologram; carrying out three-dimensional reconstruction, identification and positioning on the particle hologram to obtain three-dimensional position, particle size, morphology and concentration information of particles; ferromagnetic particles and non-ferromagnetic particles are classified according to z-axis position information in the three-dimensional position. The invention also discloses an oil abrasive particle detection device: the device comprises an oil liquid sampling unit, a microfluidic component, a laser unit, an imaging unit and a signal processing unit. The method and the device have simple structure and low cost, can realize the simultaneous online measurement of multiple parameters of the lubricating oil wear particles, and effectively distinguish and identify the ferromagnetic particles and the non-ferromagnetic particles.

CLAIM 1. The oil abrasive particle detection method based on microscopic holography and magnetic field regulation is characterized by comprising the following steps of: (1) The oil to be measured is divided into a ferromagnetic particle flow and a non-ferromagnetic particle flow under the action of a magnetic field and then enters a measuring area; (2) After being shaped by an optical element, laser beams emitted by a laser source are incident into a measuring area and respectively transmitted through a ferromagnetic particle flow and a non-ferromagnetic particle flow, scattered light of the ferromagnetic particles and the non-ferromagnetic particles is used as object light waves to interfere with unscattered laser to form holographic fringes, and the holographic fringes are recorded as particle holograms; (3) Carrying out three-dimensional reconstruction, identification and positioning on the particle hologram to obtain three-dimensional position, particle size, morphology and concentration information of particles; (4) And (3) judging a runner where the abrasive particles in the oil to be detected are positioned according to the z-axis position information in the three-dimensional position of the particles obtained in the step (3), and classifying ferromagnetic particles and non-ferromagnetic particles.



N9820

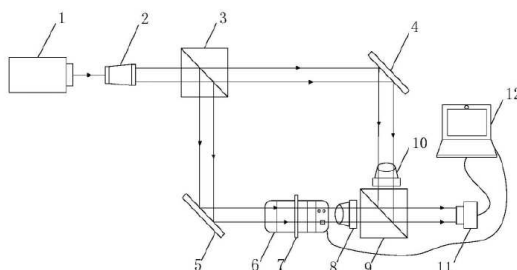
CN117031684

Priority Date: 21/08/2023

XI AN UNIVERSITY OF TECHNOLOGY

DIGITAL HOLOGRAPHIC IMAGING AUTOMATIC FOCUSING METHOD AND DEVICE

The invention discloses a digital holographic imaging automatic focusing method and a device, relates to the field of digital holographic microscopy and digital image processing, and is used for solving the problem of inaccurate digital holographic microscopy imaging focusing caused by aliasing of holographic interference fringes and object information in the prior art. The method comprises the following steps: obtaining a holographic spectrogram of a sample to be detected through a digital holographic microscopic automatic focusing system; obtaining a filtered image according to the transfer function of the holographic spectrogram and the novel filter; the filtered image is subjected to inverse Fourier transform to obtain a filtered hologram, and a new self-adaptive threshold value, a local standard deviation and a maximum gradient value corresponding to each pixel point corresponding to the filtered hologram are determined; and when the local standard deviation is larger than the new self-adaptive threshold value, determining the maximum gradient as an edge extraction value, and obtaining an evaluation function of the initial hologram according to the edge extraction value and the gray value of each pixel included in the filtered hologram.



CLAIM 1. A digital holographic imaging autofocus method comprising: obtaining an initial hologram of a sample to be detected through a digital holographic microscopic automatic focusing system, and preprocessing and Fourier transforming the initial hologram to obtain a holographic spectrogram; determining a novel filter based on the second-order Butterworth low-pass filter and the spectrum distribution of the holographic spectrogram, and obtaining a filtered image after filtering according to the transfer functions of the holographic spectrogram and the novel filter; the filtered image is subjected to inverse Fourier transform to obtain a filtered hologram, and a new self-adaptive threshold value, a local standard deviation and a maximum gradient value corresponding to each pixel point corresponding to the filtered hologram are determined; and when the local standard deviation is larger than the new self-adaptive threshold value, determining the maximum gradient as an edge extraction value, and obtaining an evaluation function of the initial hologram according to the edge extraction value and the gray value of each pixel included in the filtered hologram.

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N9787

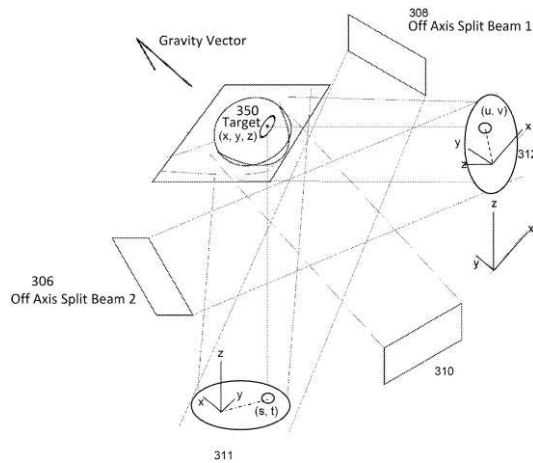
US11822287

Priority Date: 01/08/2022

LIU CHRIS HSINLAI

BINOCULAR HOLOGRAPHIC MACHINE VISION SYSTEM AND METHOD FOR IDENTIFYING LOCATIONS OF TARGET ELEMENTS

The present disclosure describes binocular machine vision systems and methods for determining locations of target elements. This disclosure describes the transformation of multiple 2D sensor data into 3-dimensional position and employs the full range of through-focus imaging using a single image for each Receptor.



CLAIM 1. A system for determining, in a first and a second holographic image receptors' common three-dimensional (X, Y, Z) coordinate system, position of a point source provided within the first and second holographic image receptors' field of view, the system comprising: the first holographic image receptor being configured to reconstruct a holographic image of the point source, whereby the holographic image corresponds to a two-dimensional location (S1, T1) on the plane of the first holographic image receptor; the second holographic image receptor being configured to reconstruct a holographic image of the point source, whereby the holographic image corresponds to a two-dimensional location (U1, V1) on the plane of the second holographic image receptor; a computing device communicatively coupled to the first and second holographic image receptors, the computing device being configured to: identify, based on a calibration table of the first holographic image receptor and on a calibration table of the second holographic image receptor, a location (X1, Y1, Z1) in the three-dimensional coordinate system that matches with the two-dimensional location (S1, T1) on the plane of the first holographic image receptor and the two-dimensional location (U1, V1) on the plane of the second holographic image receptor, whereby the location (X1, Y1, Z1) corresponds to the position of the point source, wherein each holographic image receptor's calibration table was pre-generated by, positioning a calibration point source at a plurality of calibration positions from the first and second holographic image receptors, whereby at each calibration position, the first and second holographic image receptors are configured to: reconstruct a holographic image of the calibration point source on each image receptor's plane; and for each image receptor, associate, in each image receptor's calibration table, a two-dimensional location of the holographic image on the plane of the image receptor with a location of the calibration point source as defined in the first and the second holographic image receptors' common three-dimensional (X, Y, Z) coordinate system.

N9793

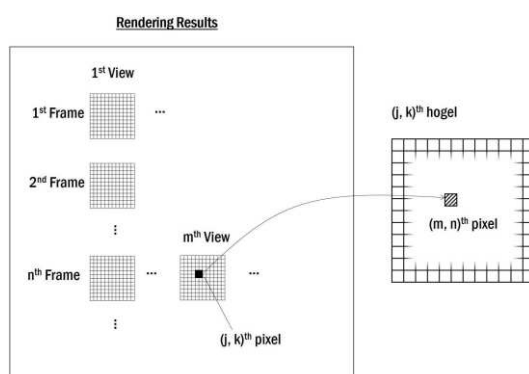
KR102597351

Priority Date: 28/12/2022

KOREA ELECTRONICS TECHNOLOGY INSTITUTE

HOLOGRAM PRINTING METHOD CAPABLE OF REPRODUCING 3D VIDEO

Provided is a hologram printing method capable of reproducing a three-dimensional video. A method for producing a video hologram film according to an embodiment of the present invention comprises the steps of rendering images having the same frame sequence number but different view points in the same column and images having the same view point but different frame sequence numbers in the same row; mapping the rendering results to a plurality of hogels constituting a hogel image; and recording the hogels on the hologram film. A three-dimensional moving picture can be recorded on the hologram film, and the recorded three-dimensional moving picture can be reproduced from the hologram film, thereby storing and enjoying the hologram as a moving picture.



CLAIM 1. A method for manufacturing a video hologram film, the method comprising: rendering images having the same frame sequence number but different view points in a horizontal direction and images having the same view points but different frame sequence numbers in a vertical direction; mapping the rendering results to a plurality of hogels constituting a hogel image; and recording the hogels on a hologram film, wherein the frame sequence number is a temporal sequence of frames constituting a video.

N9797

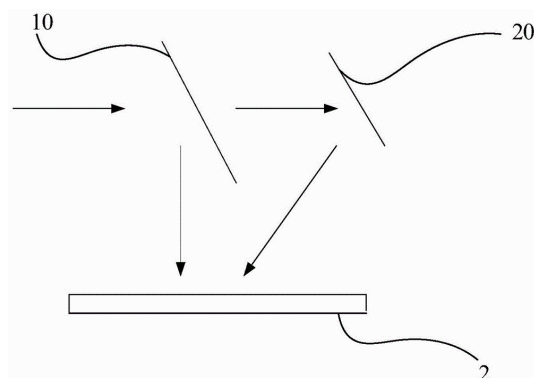
CN220019924U

Priority Date: 08/05/2023

NANCHANG VIRTUAL REALITY RESEARCH INSTITUTE

PRISM AND HOLOGRAPHIC BODY GRATING

The embodiment of the utility model provides a prism and a holographic grating, wherein the prism comprises a light-transmitting prism, and the prism comprises a first surface, a second surface, a third surface, a fourth surface and a fifth surface; the first surface and the fifth surface are arranged in parallel with each other; the second face, the third face and the fourth face are mutually shared, and have the same preset included angle with the first face or the fifth face respectively; orthographic projections of the first face, the second face, the third face, and the fourth face can all overlap on the fifth face. Compared with the prior art, the prism provided by the utility model can realize the technical effects of preparing the coupling-in grating, the turning grating and the coupling-out grating. The holographic body grating can achieve the purposes of reducing cost and being lighter.



CLAIM 1. A prism, wherein a first surface, a second surface, a third surface, a fourth surface and a fifth surface are arranged on the prism; the first surface and the fifth surface are arranged in parallel with each other; the second face, the third face and the fourth face are mutually shared, and have the same preset included angle with the first face or the fifth face respectively; orthographic projections of the first face, the second face, the third face, and the fourth face can all overlap on the fifth face.

N9815

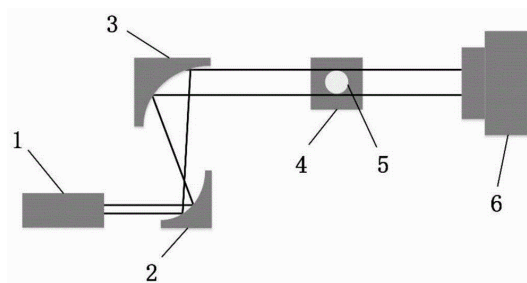
CN117054366

Priority Date: 12/07/2023

BEIJING UNIVERSITY OF TECHNOLOGY

CONTINUOUS TERAHERTZ WAVE DIFFRACTION TOMOGRAPHY METHOD BASED ON COAXIAL DIGITAL HOLOGRAPHY

The invention discloses a continuous terahertz wave diffraction tomography method based on coaxial digital hologram, which comprises the steps of finishing superposition average pretreatment, normalization treatment and reproduction of coaxial digital hologram. The method for reconstructing the three-dimensional complex refractive index distribution of the sample by using the continuous terahertz wave diffraction tomography method based on coaxial digital holography comprises the following three steps: the coaxial digital hologram reconstruction of the sample under different rotation angles is completed by utilizing the pretreatment of the coaxial digital hologram and a physical enhanced neural network method; performing Rytov approximation treatment on the complex amplitude distribution of the projection light field of the sample under different rotation angles to obtain scattered field distribution of the sample under Rytov approximation; and reconstructing the scattering field distribution by using a filtering back propagation algorithm to obtain scattering potential distribution of the sample, and calculating three-dimensional complex refractive index distribution of the sample according to the relation between the scattering potential and the refractive index.



CLAIM 1. A continuous terahertz wave diffraction tomography system based on coaxial digital holography is characterized in that: comprising CO 2 The device comprises a pumping terahertz laser, a first gold-plated off-axis parabolic mirror, a second gold-plated off-axis parabolic mirror, an electric rotating table, a measured sample and a pyroelectric detector; CO 2 the pumping terahertz laser is used for outputting continuous terahertz waves; the first gold-plated off-axis parabolic mirror and the second gold-plated off-axis parabolic mirror form a beam expanding unit for expanding CO 2 The diameter of the terahertz wave optical spot output by the pumping terahertz laser is enlarged, and the propagation directions of the terahertz wave optical spot are parallel; the terahertz waves after beam expansion are transmitted to a tested sample, the tested sample is placed on an electric rotating table, transmitted light waves of the tested sample under different rotating angles are transmitted to a pyroelectric detector by controlling the electric rotating table, and the coaxial digital hologram of the sample can be recorded by the pyroelectric detector.

N9830

CN116991052

Priority Date: 03/08/2023

WUHAN YINCAITIAN PAPER

THREE-DIMENSIONAL VISUAL HOLOGRAPHIC PLATE MAKING METHOD FOR BLACK-WHITE GRAPHIC ELEMENTS

The application discloses a three-dimensional visual holographic plate making method of black-and-white graphic elements, which comprises the steps of modeling, creating a UV (ultraviolet) map, forming textures, obtaining effects and outputting image information. The application creates a three-dimensional geometric object with texture maps by generating a black-and-white image in a three-dimensional space, modeling and generating the three-dimensional geometric object to create a black-and-white relief map, which simplifies the process of creating a holographic matrix, can realize higher precision and image details, and quickly visualizes and prepares the image for lithography printing.

CLAIM 1. A three-dimensional visual holographic plate making method of black-and-white graphic elements comprises the following steps: a. modeling; b. creating a UV map; c. forming textures; d. obtaining an effect; e. and outputting the image information.

N9831

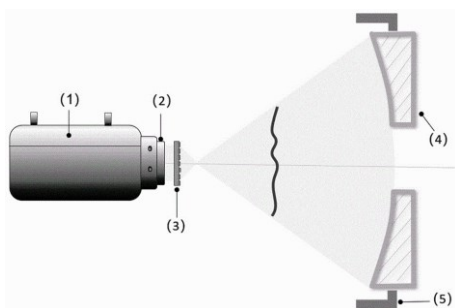
CN116989692

Priority Date: 21/06/2023

ZHEJIANG UNIVERSITY

EXTREME ULTRAVIOLET LITHOGRAPHY OBJECTIVE LENS SURFACE SHAPE DETECTION METHOD AND SYSTEM BASED ON SUBWAVELENGTH STRUCTURE CALCULATION HOLOGRAM

The invention discloses an extreme ultraviolet lithography objective lens surface shape detection method and system based on sub-wavelength structure calculation hologram. According to the method for detecting the surface shape of the extreme ultraviolet lithography objective based on the subwavelength structure calculation hologram, the design and the application of the subwavelength structure calculation hologram can obtain high-precision aspheric surface shape data of the extreme ultraviolet lithography objective, and the detection precision can reach RMS smaller than 1nm. The calculated hologram of the invention has single height, is very favorable for accurate etching processing with low cost, and has larger phase modulation capability than the traditional step-type calculated hologram.



CLAIM 1. The method for detecting the surface shape of the extreme ultraviolet lithography objective based on the subwavelength structure calculation hologram is characterized by comprising the following steps of: (1) Determining the placement position of the subwavelength structural calculation hologram according to the design surface shape data of the detected aspheric mirror, and calculating to obtain a continuous phase distribution function of the subwavelength structural calculation hologram according to the placement position and the surface shape data; (2) Performing discretized phase value processing of N gray levels on the continuous phase distribution function obtained in the step (1), wherein $N=2k$ k is positive integer; (3) Designing a mapping data table of structural parameters and discretized phase data of a sub-wavelength structural unit in the sub-wavelength structural calculation hologram, and taking the mapping data table as a basis of structural design of the sub-wavelength structural calculation hologram; (4) Converting the discretized phase value in the step (2) based on the mapping data table in the step (3) to obtain a design scheme of a sub-wavelength structural unit of the sub-wavelength structural calculation hologram, and performing pattern processing on a substrate according to the design scheme of the sub-wavelength structural unit to obtain the sub-wavelength structural calculation hologram; (5) Placing the subwavelength structural calculation hologram at the placement position determined in the step (1), sending out light rays for detection by a standard interferometer, processing the light rays into plane waves by the standard plane mirror, reflecting one part of the plane waves back to the standard interferometer to form a reference light path, transmitting the other part of the plane waves through the standard plane mirror and incident on the subwavelength structural calculation hologram, converting the incident plane waves into aspheric waves, matching the aspheric waves with the surface shape of the aspheric mirror to be detected, and returning the aspheric waves to the standard interferometer to form a test light path after being reflected by the aspheric mirror to be detected; (6) And adjusting the spatial posture of the detected aspherical reflecting mirror to enable the light of the test light path to interfere with the light of the reference light path in the standard interferometer to form zero interference measurement, and obtaining the surface shape data of the detected aspherical reflecting mirror by resolving the obtained interference pattern.

N9839

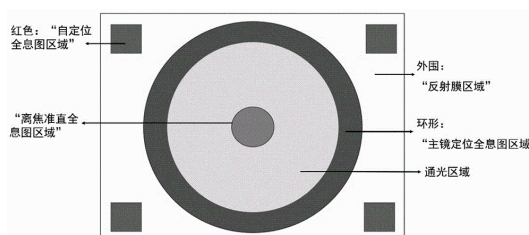
CN116953951

Priority Date: 26/06/2023

ZHEJIANG UNIVERSITY

EXTREME ULTRAVIOLET OBJECTIVE LENS ADJUSTMENT METHOD BASED ON CO-BODY MULTIPLEXING HOLOGRAM

The invention discloses an extreme ultraviolet objective lens adjusting method based on a common body multiplexing hologram. By using the hologram, the attitude positions of the hologram, the concave main mirror and the standard auto-collimation mirror are ensured, a plurality of objects are calibrated simultaneously and statically by using one hologram, and the error source of the extreme ultraviolet lithography objective lens is avoided. The focus of the interferometer coincides with the object point on the optical axis of the extreme ultraviolet lithography objective lens, and the assembling and adjusting system is simplified. In the adjustment method, the error precision is ensured by three items of measurement precision of a standard interferometer, flatness of a standard auto-collimation reflector and hologram precision. The error sources of the adjustment precision are fewer, and the error is smaller.



CLAIM 1. A multiplexed hologram for use in assembling an evu objective lens comprising a concave primary mirror and a convex secondary mirror, the assembly also being performed using an interferometer, the multiplexed hologram comprising a substrate, the hologram comprising: a reflective film area coated with a reflective film for calibrating the parallelism of the optical axes of the hologram and the interferometer, a self-positioning hologram area for calibrating the optical axis coincidence ratio, position positioning and attitude positioning of the co-multiplexing hologram and the interferometer, the main mirror positioning hologram area is used for calibrating the optical axis coincidence ratio, position and gesture of the common multiplexing hologram, the concave main mirror and the interferometer, and the defocused collimation hologram area is used for calibrating the position and the posture of the convex secondary mirror.

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HOLOGRAMS - 7 PATENTS

REFERENCE	COUNTRY	PATENT NUMBER	PUBLICATION DATE Day-Month-Year	APPLICANT	PRIORITY	PRIORITY DATE Day-Month-Year	PRIORITY NUMBER	EQUIVALENTS	TITLE	KEY WORDS
P37047	WO	2023214546	09/11/2023	DAI NIPPON PRINTING	JP	02/05/2022	JP2022000076214	WO2023214546	COMPUTER PROGRAM, AUTHENTICITY DETERMINATION DEVICE, AND AUTHENTICITY DETERMINATION METHOD	
P37096	CN	220011605	14/11/2023	JIANGSU ZHENXIANG ANTI COUNTERFEITING TECHNOLOGY	CN	16/06/2023	CN2023001537386	CN220011605U	TRANSPARENT LASER HOLOGRAPHIC ANTI-FAKE FILM ELECTROSTATIC PATTERN ELIMINATING DEVICE	
P37097	CN	220009181	14/11/2023	JIANGSU ZHENXIANG ANTI COUNTERFEITING TECHNOLOGY	CN	28/04/2023	CN2023001000113	CN220009181U	LASER HOLOGRAPHIC ANTI-FAKE LABEL LAMINATING DEVICE	
P37102	CN	219979037	07/11/2023	WUXI NEW LIGHT IMPRESSION PREVENTING FAISE TECHNIQUE	CN	08/02/2023	CN2023000152143	CN219979037U	WATERPROOF ANTI-COUNTERFEITING LABEL	
P37103	CN	219979036	07/11/2023	WUXI NEW LIGHT IMPRESSION PREVENTING FAISE TECHNIQUE	CN	01/02/2023	CN2023000095916	CN219979036U	SCRATCH-RESISTANT COATING LABEL STRUCTURE CAPABLE OF IDENTIFYING ANTI-COUNTERFEITING INFORMATION	
P37132	CN	116968462	31/10/2023	WUHAN HUAGONG IMAGE TECHNOLOGY & DEVELOPMENT	CN	21/08/2023	CN2023001064499	CN116968462	ANTI-PLATE-TURNOVER HOLOGRAPHIC ELECTROCHEMICAL ALUMINUM AND PREPARATION METHOD THEREOF	
P37138	CN	116945786	27/10/2023	ZHANG JIANFA	CN	03/08/2023	CN2023000973125	CN116945786	MANUFACTURING METHOD OF DIRECT-WRITING VARIABLE LASER HOLOGRAPHIC SERIAL NUMBER	

VARIOUS OPTICAL EFFECTS - 11 PATENTS

REFERENCE	COUNTRY	PATENT NUMBER	PUBLICATION DATE Day-Month-Year	APPLICANT	PRIORITY	PRIORITY DATE Day-Month-Year	PRIORITY NUMBER	EQUIVALENTS	TITLE	KEY WORDS
P37043	WO	2023222156	23/11/2023	GIESECKE & DEVRIENT CURRENCY TECHNOLOGY	DE	18/05/2022	DE202210001749	WO2023222156 DE102022001749	VALUE DOCUMENT, AND METHOD FOR PRODUCING A VALUE DOCUMENT	
P37059	WO	2023208429	02/11/2023	IDEMIA	FR	27/04/2022	FR2022000003927	WO2023208429 FR3135013	SECURITY DOCUMENT THAT CAN BE USED TO VIEW AN IMAGE COMPRISING A PLASMONIC FILM WITH PERFORATIONS	
P37068	KR	102597533	02/11/2023	NBST	KR	01/07/2022	KR2022000081296	KR102597533	FORGERY PREVENTION MEANS FOR PREVENTING DELAMINATION AND FORGERY AUTHENTICATION METHOD USING SAME	
P37081	EP	4279292	22/11/2023	MB AUTOMATION	DE	19/05/2022	DE202210112628	EP4279291 EP4279292	DOCUMENT PROCESSING APPARATUS	
P37085	EP	4275912	15/11/2023	HUECK FOLIEN	EP	10/05/2022	EP2022000172504	EP4275912	SAFETY ELEMENT	Moth's eye structure
P37086	EP	4275911	15/11/2023	HUECK FOLIEN	EP	10/05/2022	EP2022000172502	EP4275911	SAFETY ELEMENT	Moth's eye structure
P37088	EP	4269124	01/11/2023	RUIZ QUEVEDO ANDRES	EP	26/04/2022	EP2022000382394	EP4269124 WO2023209257	LENTICULAR ARRAY	Microlens
P37089	EP	4269123	01/11/2023	THALES DIS	EP	29/04/2022	EP2022000305645	EP4269123 WO2023209242	SECURITY ELEMENT WITH COLORSHIFT	Passport
P37092	CN	220053321	21/11/2023	SHANGHAI GUANZHONG OPTICAL TECHNOLOGY	CN	30/05/2023	CN2023001342966	CN220053321U	TRANSPARENT WINDOW FILM FOR ANTI-FAKE CERTIFICATE AND ANTI-FAKE CERTIFICATE CARD	Microlens
P37130	CN	116970384	31/10/2023	TECHNICAL INSTITUTE OF PHYSICS & CHEMISTRY - CHINESE ACADEMY OF SCIENCES	CN	22/04/2022	CN2022000427831	CN116970384	PHOSPHORESCENT DYE AND TRIPLE ANTI-COUNTERFEITING PHOTONIC CRYSTAL FILM CONTAINING PHOSPHORESCENT DYE, AND PREPARATION AND APPLICATION THEREOF	
P37131	CN	116968465	31/10/2023	NINGBO INSTITUTE OF MATERIALS TECHNOLOGY & ENGINEERING - CHINESE ACADEMY OF SCIENCES QIANWAN INSTITUTE OF CNITECH	CN	21/07/2023	CN2023000902907	CN116968465	CHARACTERISTIC INFORMATION CARRIER WITH MULTILAYER STRUCTURE, METHOD FOR PRODUCING THE SAME AND USE THEREOF	

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NON SECURITY HOLOGRAMS - 59 PATENTS

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N9783	WO	2023219251	16/11/2023	WONKWANG UNIVERSITY INDUSTRY ACADEMIC COOPERATION FOUNDATION	KR	12/05/2022	KR2022000058319	WO2023219251	HOLOGRAPHIC OPTICAL ELEMENT-BASED SLIM-TYPE SPATIAL IMAGE DISPLAY SYSTEM	
N9784	WO	2023210212	02/11/2023	PANASONIC INTELLECTUAL PROPERTY MANAGEMENT	JP	27/04/2022	JP2022000073140	WO2023210212 JP2023163110	HOLOGRAM MANUFACTURING DEVICE AND HOLOGRAM MANUFACTURING METHOD	
N9785	WO	2023208962	02/11/2023	GOMER, ANDREAS ARNDT, MARTIN GREVERATH, JULIAN CAPPUCILLI, MICHELE	EP	27/04/2022	EP2022000170283	WO2023208962	COMPOSITE PANE WITH A REFLECTIVE LAYER AND A HOLOGRAM ELEMENT	
N9786	WO	2023208843	02/11/2023	SYDDANSK UNIVERSITET	EP	25/04/2022	EP2022000169752	WO2023208843	HOLOGRAPHIC SYSTEM WITH IMPROVED PROJECTION QUALITY	
N9787	US	11822287	21/11/2023	LIU CHRIS HSNLAI	SG	01/08/2022	SG2022001050644	US11822287	BINOCULAR HOLOGRAPHIC MACHINE VISION SYSTEM AND METHOD FOR IDENTIFYING LOCATIONS OF TARGET ELEMENTS	
N9788	TW	646260	21/09/2023	XU, SHU-CHENG	TW	10/11/2022	TW2022000212321	TWM646260	HOLOGRAPHIC PROJECTION DEVICE	
N9789	KR	20230151283	01/11/2023	KOREA MARINE ENVIRONMENT MANAGEMENT STN	KR	25/04/2022	KR2022000050775	KR20230151283	HOLOGRAM DISPLAY DEVICE	
N9790	KR	20230150121	30/10/2023	KOREA ELECTRONICS & TELECOMMUNICATIONS RESEARCH INSTITUTE	KR	21/04/2022	KR2022000049682	KR20230150121	APPARATUS AND METHOD FOR PLAYING STEREOSCOPIC SENSORY CONTENT	
N9791	KR	20230149955	30/10/2023	I-TECH	KR	21/04/2022	KR2022000049305	KR20230149955	MANUFACTURING METHOD, MANUFACTURING APPARATUS, AND REFLECTIVE FABRIC FOR PRODUCING HOLOGRAM EFFECT	
N9792	KR	102597352	02/11/2023	KOREA ELECTRONICS TECHNOLOGY INSTITUTE	KR	28/12/2022	KR2022000186547	KR102597352	METHOD OF REPRODUCING MULTI-DEPTH IMAGE USING HOLOGRAPHIC OPTICAL ELEMENT	
N9793	KR	102597351	02/11/2023	KOREA ELECTRONICS TECHNOLOGY INSTITUTE	KR	28/12/2022	KR2022000186545	KR102597351	HOLOGRAM PRINTING METHOD CAPABLE OF REPRODUCING 3D VIDEO	
N9794	GB	2618630	15/11/2023	ENVISICS	GB	20/10/2022	GB2022000015505	GB202215505 GB2618630	HOLOGRAM CALCULATION FOR COMPACT HEAD-UP DISPLAY	
N9795	CN	220040973	17/11/2023	SHENZHEN LIZHI TECHNOLOGY	CN	13/06/2023	CN2023001512900	CN220040973U	360-DEGREE HOLOGRAPHIC IMAGING DEVICE	
N9796	CN	220020089	14/11/2023	SHANGHAI INTLIGHT THIN FILM TECHNOLOGY	CN	13/06/2023	CN2023001504684	CN220020089U	TRANSPARENT HOLOGRAPHIC PROJECTION DISPLAY PROTECTION FILM EXTERNALLY ATTACHED TO GLASS CURTAIN WALL	
N9797	CN	220019924	14/11/2023	NANCHANG VIRTUAL REALITY RESEARCH INSTITUTE	CN	08/05/2023	CN2023001077258	CN220019924U	PRISM AND HOLOGRAPHIC BODY GRATING	
N9798	CN	219999515	10/11/2023	SICHUAN BINGFENG TECHNOLOGY	CN	09/03/2023	CN2023000432739	CN219999515U	INTELLIGENT HOLOGRAPHIC PROJECTION SOUND BOX	
N9799	CN	219989900	10/11/2023	DONGGUAN BASHUBAN DIGITAL TECHNOLOGY	CN	28/03/2023	CN2023000639394	CN219989900U	WHITE SPIRIT BOTTLE WITH HOLOGRAPHIC DISPLAY DEVICE	
N9800	CN	219980893	07/11/2023	NAIRUI LIGHTING SHANGHAI	CN	24/04/2023	CN2023000948807	CN219980893U	HOLOGRAPHIC IMAGE EQUIPMENT BASED ON REMOTE INTERACTION PLATFORM	
N9801	CN	219978688	07/11/2023	SHANGHAI ZHENRUI MULTIMEDIA TECHNOLOGY	CN	12/06/2023	CN2023001480772	CN219978688U	HOLOGRAPHIC PROJECTION DEVICE	
N9802	CN	219958081	03/11/2023	SHENYANG JINGXUAN INTELLIGENT DIGITAL TECHNOLOGY	CN	19/05/2023	CN2023001212958	CN219958081U	MULTIMEDIA HOLOGRAPHIC PROJECTION DEVICE	
N9803	CN	219958080	03/11/2023	FUJIAN NORMAL UNIVERSITY	CN	01/06/2023	CN2023001369523	CN219958080U	SCALAR VORTEX BEAM GENERATION SYSTEM FOR COAXIAL TRADITIONAL OR POLARIZATION HOLOGRAPHY	
N9804	CN	219957969	03/11/2023	JINGMEN CITY DREAM EXPLORATION TECHNOLOGY	CN	23/02/2021	CN2021000412905	CN219957969U	TRANSMISSION TYPE GEOMETRIC HOLOGRAPHIC SCREEN WITH OPENING ANGLE	
N9805	CN	219903331	27/10/2023	GUANGQUN LASER SCIENCE & TEC	CN	16/05/2023	CN2023001180914	CN219903331U	ALIGNMENT TYPE HOLOGRAPHIC FILM FORMING EQUIPMENT	
N9806	CN	117095575	21/11/2023	XIAMEN QIYI TECHNOLOGY	CN	02/06/2023	CN2023001178727	CN117095575	LEARNING MACHINE BASED ON HOLOGRAPHIC DISPLAY	

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NON SECURITY HOLOGRAMS - 59 PATENTS (continuation)

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N9807	CN	117087545	21/11/2023	CHONGQING SAILISI NEW ENERGY AUTOMOBILE DESIGN INSTITUTE	CN	28/09/2023	CN2023001278462	CN117087545	WORKING METHOD AND DEVICE OF HOLOGRAPHIC ELECTRONIC REARVIEW MIRROR SYSTEM	
N9808	CN	117079705	17/11/2023	HUAZHONG UNIVERSITY OF SCIENCE & TECHNOLOGY	CN	10/07/2023	CN2023000839668	CN117079705	HOLOGRAPHIC STORAGE METHOD, DEVICE AND SYSTEM BASED ON DATA COMPRESSION	
N9809	CN	117079109	17/11/2023	GUANGDONG XIAOTENG ZHIJIA TECHNOLOGY	CN	25/08/2023	CN2023001079854	CN117079109	IMMERSION TYPE HOLOGRAPHIC PROJECTION IMAGE PROCESSING METHOD AND VR SYSTEM FOR SMART HOME	
N9810	CN	117075739	17/11/2023	SHENZHEN EUCLIDEON TECHNOLOGY	CN	13/10/2023	CN2023001323312	CN117075739	HOLOGRAPHIC SAND TABLE-BASED HOLOGRAPHIC DISPLAY METHOD AND RELATED DEVICE	
N9811	CN	117075455	17/11/2023	UNIVERSITY BEIJING	CN	24/08/2023	CN2023001071573	CN117075455	OFF-AXIS HOLOGRAPHIC BEAM COMBINING DEVICE AND METHOD BASED ON MISSING REFLECTOR	
N9812	CN	117075347	17/11/2023	SHANGHAI UNIVERSITY	CN	29/08/2023	CN2023001098550	CN117075347	HOLOGRAPHIC NEAR-TO-EYE DISPLAY DEVICE AND METHOD FOR LARGE-EYE PUPIL BOX	
N9813	CN	117075293	17/11/2023	CHANGCHUN CHANGGUANG ADVANCED OPTICS TECHNOLOGY	CN	17/10/2023	CN2023001338894	CN117075293	SUBMICRON-LEVEL MULTI-RING-BELT MULTILEVEL ALIGNMENT DETECTION DEVICE AND METHOD FOR CALCULATING HOLOGRAM	
N9814	CN	117055318	14/11/2023	ALPPO TECHNOLOGY	CN	17/07/2023	CN2023000877088	CN117055318	IMAGING METHOD OF HOLOGRAPHIC IMAGE, SYSTEM AND MAIN CONTROL EQUIPMENT THEREOF	
N9815	CN	117054366	14/11/2023	BEIJING UNIVERSITY OF TECHNOLOGY	CN	12/07/2023	CN2023000849183	CN117054366	CONTINUOUS TERAHERTZ WAVE DIFFRACTION TOMOGRAPHY METHOD BASED ON COAXIAL DIGITAL HOLOGRAPHY	
N9816	CN	117054296	14/11/2023	ZHEJIANG UNIVERSITY	CN	16/08/2023	CN2023001032687	CN117054296	OIL ABRASIVE PARTICLE DETECTION METHOD AND DEVICE BASED ON MICROSCOPIC HOLOGRAM AND MAGNETIC FIELD REGULATION	
N9817	CN	117031906	10/11/2023	BEIHANG UNIVERSITY OF AERONAUTICS & ASTRONAUTICS	CN	07/09/2023	CN2023001152751	CN117031906	METHOD FOR WIDENING HOLOGRAPHIC FIELD ANGLE BASED ON MULTI-ANGLE OPTICAL INTEGRAL LIGHTING SYSTEM	
N9818	CN	117031875	10/11/2023	NANCHANG VIRTUAL REALITY RESEARCH INSTITUTE	CN	26/06/2023	CN2023000762077	CN117031875	HOLOGRAPHIC RECORDING MEDIUM AND DISPLAY DEVICE	
N9819	CN	117031775	10/11/2023	TIANMA	CN	30/05/2023	CN2023000631070	CN117031775	DISPLAY DEVICE, CONTROL METHOD THEREOF AND HOLOGRAPHIC 3D DISPLAY SCREEN	
N9820	CN	117031684	10/11/2023	XI AN UNIVERSITY OF TECHNOLOGY	CN	21/08/2023	CN2023001050552	CN117031684	DIGITAL HOLOGRAPHIC IMAGING AUTOMATIC FOCUSING METHOD AND DEVICE	
N9821	CN	117031617	10/11/2023	ZHEJIANG UNIVERSITY	CN	24/08/2023	CN2023001073141	CN117031617	CURVED SURFACE HOLOGRAPHIC WAVEGUIDE COMBINER WITH TWO-DIMENSIONAL PUPIL EXPANSION AND APPLICATION THEREOF	
N9822	CN	117031604	10/11/2023	GENERAL INTERFACE SOLUTION GIS TECHNOLOGY INTERFACE OPTOELECTRONIC YECHENG PHOTOELECTRIC WUXI	CN	30/08/2023	CN2023001111832	CN117031604	VOLUME HOLOGRAPHIC GRATING AND PREPARATION METHOD THEREOF, OPTICAL WAVEGUIDE STRUCTURE AND NEAR-EYE DISPLAY DEVICE	
N9823	CN	117031601	10/11/2023	HEFEI UNIVERSITY OF TECHNOLOGY	CN	21/08/2023	CN2023001050853	CN117031601	EXPOSURE DEVICE FOR PREPARING VOLUME HOLOGRAPHIC GRATING	
N9824	CN	117029714	10/11/2023	NATIONAL UNIVERSITY OF DEFENSE TECHNOLOGY	CN	09/10/2023	CN2023001295593	CN117029714	ANTI-INTERFERENCE HOLOGRAPHIC IMAGE GENERATION SYSTEM AND METHOD BASED ON QUANTUM INTERFERENCE	
N9825	CN	117024657	10/11/2023	JOURNEY TECHNOLOGY	CN	28/09/2023	CN2023001278087	CN117024657	HOLOGRAPHIC POLYMER DISPERSED LIQUID CRYSTAL MATERIAL AND APPLICATION THEREOF	
N9826	CN	117012121	07/11/2023	SHENZHEN ZHONGRUN OPTOELECTRONICS TECHNOLOGY	CN	15/08/2023	CN2023001025100	CN117012121	HOLOGRAPHIC DISPLAY DEVICE WITH PROTECTION FUNCTION	
N9827	CN	117008440	07/11/2023	BEIHANG UNIVERSITY OF AERONAUTICS & ASTRONAUTICS	CN	23/08/2023	CN2023001064468	CN117008440	COLOR SPHERICAL HOLOGRAPHIC DISPLAY SYSTEM BASED ON CONFORMAL DIFFRACTION PRINCIPLE	
N9828	CN	117008405	07/11/2023	CHANGCHUN VOCATIONAL INSTITUTE OF TECHNOLOGY	CN	07/10/2023	CN2023001280412	CN117008405	THREE-DIMENSIONAL HOLOGRAPHIC DEVICE USING MULTIMEDIA TECHNOLOGY	
N9829	CN	117008235	07/11/2023	GENERAL INTERFACE SOLUTION GIS TECHNOLOGY INTERFACE OPTOELECTRONIC YECHENG PHOTOELECTRIC WUXI	CN	22/08/2023	CN2023001069504	CN117008235	APPARATUS AND METHOD FOR MANUFACTURING HOLOGRAM OPTICAL ELEMENT	

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REFERENCE	COUNTRY	PATENT NUMBER	PUBLICATION DATE Day-Month-Year	APPLICANT	PRIORITY	PRIORITY DATE Day-Month-Year	PRIORITY NUMBER	EQUIVALENTS	TITLE	KEY WORDS
N9830	CN	116991052	03/11/2023	WUHAN YINCAITIAN PAPER	CN	03/08/2023	CN2023000974950	CN116991052	THREE-DIMENSIONAL VISUAL HOLOGRAPHIC PLATE MAKING METHOD FOR BLACK-WHITE GRAPHIC ELEMENTS	
N9831	CN	116989692	03/11/2023	ZHEJIANG UNIVERSITY	CN	21/06/2023	CN2023000740743	CN116989692	EXTREME ULTRAVIOLET LITHOGRAPHY OBJECTIVE LENS SURFACE SHAPE DETECTION METHOD AND SYSTEM BASED ON SUBWAVELENGTH STRUCTURE CALCULATION HOLOGRAM	
N9832	CN	116985712	03/11/2023	GREAT WALL MOTOR	CN	11/08/2023	CN2023001014015	CN116985712	HOLOGRAPHIC PROJECTION CONTROL METHOD AND DEVICE, STORAGE MEDIUM AND VEHICLE	
N9833	CN	116977585	31/10/2023	CHONGQING DIWUWEI TECHNOLOGY	CN	02/08/2023	CN2023000964476	CN116977585	HOLOGRAPHIC PROJECTION METHOD	
N9834	CN	116977183	31/10/2023	ADVANCED INSTITUTE OF INFORMATION TECHNOLOGY AHIT PEKING UNIVERSITY HANGZHOU WEIMING XINKE TECHNOLOGY	CN	22/09/2023	CN2023001226606	CN116977183	INTELLIGENT CONSTRUCTION SITE HOLOGRAPHIC IMAGE DISPLAY SPLICING METHOD AND SYSTEM USING SAME	
N9835	CN	116974170	31/10/2023	UNIVERSITY OF SCIENCE & TECHNOLOGY OF CHINA	CN	15/08/2023	CN2023001023842	CN116974170	SPATIAL LIGHT MODULATION SYSTEM, METHOD AND HOLOGRAPHIC IMAGE GENERATION METHOD	
N9836	CN	116958353	27/10/2023	SHENZHEN EUCLIDEON TECHNOLOGY	CN	27/07/2023	CN2023000933482	CN116958353	HOLOGRAPHIC PROJECTION METHOD BASED ON DYNAMIC CAPTURE AND RELATED DEVICE	
N9837	CN	116957012	27/10/2023	UNIVERSITY BEIJING	CN	27/07/2023	CN2023000929396	CN116957012	DIGITAL HOLOGRAPHIC COMPRESSION TRANSMISSION METHOD ADOPTING QUANTUM COMPENSATION HYBRID NEURAL NETWORK	
N9838	CN	116954047	27/10/2023	XIDIAN UNIVERSITY	CN	10/07/2023	CN2023000840302	CN116954047	MULTIDIMENSIONAL COMPLEX AMPLITUDE HOLOGRAPHIC IMAGING METHOD BASED ON WAVELENGTH DIVISION MULTIPLEXING OPTICAL WAVEGUIDE CHIP	
N9839	CN	116953951	27/10/2023	ZHEJIANG UNIVERSITY	CN	26/06/2023	CN2023000759047	CN116953951	EXTREME ULTRAVIOLET OBJECTIVE LENS ADJUSTMENT METHOD BASED ON CO-BODY MULTIPLEXING HOLOGRAM	
N9840	CN	116953928	27/10/2023	SUNNY OPTICAL ZHEJIANG RESEARCH INSTITUTE	CN	20/04/2022	CN2022000414851	CN116953928	NEAR-EYE HOLOGRAPHIC DISPLAY OPTICAL MACHINE, NEAR-EYE HOLOGRAPHIC DISPLAY EQUIPMENT AND NEAR-EYE HOLOGRAPHIC DISPLAY METHOD	
N9841	CN	116943257	27/10/2023	3D NEW CULTURE	CN	28/08/2023	CN2023001086623	CN116943257	VIRTUAL-REAL COMBINED HOLOGRAPHIC STAGE IMAGING METHOD, MEDIUM AND HOLOGRAPHIC STAGE IMAGING SYSTEM	