

# IHMA PATENT NEWSLETTER

*Limited circulation patent news bulletin for the Holography Industry*

**MAY 2022 – 119 PATENTS**

Published and granted patents

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Please note that:

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

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**P34951**

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

**WO202296833**

**BANQUE DE FRANCE**

**Inventors:**

CHIKHA KHALIL | BARATS MICHEL

**Application Nber / Date:**

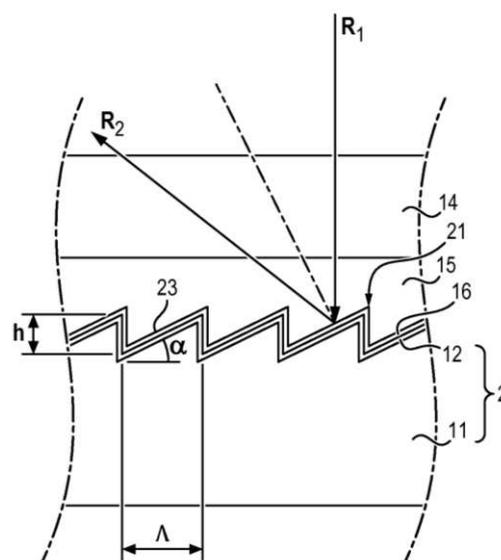
WOFR2021/051949 2021-11-04

**Priority Nber / Date / Country:**

FR2011403 2020-11-06

**METHOD FOR PRODUCING A SECURITY DOCUMENT**

The invention relates to a method for producing a security document, which comprises the steps of: • a - forming microstructures (21) in a substrate by pressing a die having microreliefs against a surface of the substrate, the microstructures having alternating projections and depressions, • b - coating the microstructures (21) with an index step layer (16) so that the microstructures can reflect incident light radiation, the index step layer having a thickness that is less than a depth of the microreliefs, and • c - covering the surface of the substrate, including the microstructures (21) and the index step layer, with a protective film (3) of polymer material, the protective film (3) comprising a layer of polymer material and a layer of adhesive, so that the layer of adhesive at least partially fills the depressions and matches the shape of the projections of the microstructures (21) coated with the index step layer, wherein the index step layer has a refractive index different from a refractive index of the protective film (3) of polymer material.



**PROCEDE DE FABRICATION D'UN DOCUMENT DE SECURITE**

• a - former des microstructures (21) dans un substrat par pressage d'une matrice présentant des microreliefs contre une surface du substrat, les microstructures présentant en alternance des saillies et des creux, • b - revêtir les microstructures (21) d'une couche à saut d'indice (16) afin que les microstructures puissent renvoyer un rayonnement lumineux incident, la couche à saut d'indice présentant une épaisseur inférieure à une profondeur des micro reliefs, et • c - recouvrir la surface du substrat, y compris les microstructures (21) et la couche à saut d'indice, par un film de protection (3) en matériau polymère, le film de protection (3) comprenant une couche en matériau polymère et une couche d'adhésif, de sorte que la couche d'adhésif remplit au moins partiellement les creux et épouse les saillies des microstructures (21) revêtues de la couche à saut d'indice, dans lequel la couche à saut d'indice présente un indice de réfraction différent d'un indice de réfraction du film de protection (3) en matériau polymère.

**CLAIM 1.** Method for manufacturing a security document (1), comprising steps of: a - forming microstructures (21) in a substrate (2) by pressing a die (33) having microreliefs against a surface of the substrate (2), the microstructures having alternating protrusions and depressions, b - coating the microstructures (21) with a step-index layer (16) so that the microstructures can reflect incident light radiation, the step-index layer (16) having a thickness less than a depth (h) of the microreliefs, and c - covering the surface of the substrate (2), including the microstructures (21) and the step index layer, with a protective film (3) of polymeric material, the protective film (3) comprising a layer of polymeric material (14) and a layer of adhesive (15), such that the adhesive layer (15) at least partially fills the recesses and conforms to the protrusions of the microstructures (21) coated with the step-index layer (16), wherein the step-index layer (16) has a refractive index different from a refractive index of the protective film (3) made of polymer material.

**Equivalent:** FR3116022A1

**Status:** Pending

**Research Report:**

**INTERNATIONAL SEARCH REPORT**

International application No.  
**PCT/FR2021/051949**

<b>A. CLASSIFICATION OF SUBJECT MATTER</b>		
<i>B42D 25/324</i> (2014.01); <i>B42D 25/328</i> (2014.01); <i>B42D 25/36</i> (2014.01); <i>B42D 25/378</i> (2014.01); <i>B42D 25/425</i> (2014.01); <i>B42D 25/455</i> (2014.01); <i>B42D 25/47</i> (2014.01)		
According to International Patent Classification (IPC) or to both national classification and IPC		
<b>B. FIELDS SEARCHED</b>		
Minimum documentation searched (classification system followed by classification symbols) B42D		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched		
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) EPO-Internal		
<b>C. DOCUMENTS CONSIDERED TO BE RELEVANT</b>		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	GB 2566975 A (DE LA RUE INT LTD [GB]) 03 April 2019 (2019-04-03) page 15, line 23 - page 18, line 8; figure 2	1-31

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

**P34938**

**OVD – PRINTING – CARD – INFRARED – RELIEF – MICROLENS**

**WO2022102751**

**DAI NIPPON PRINTING**

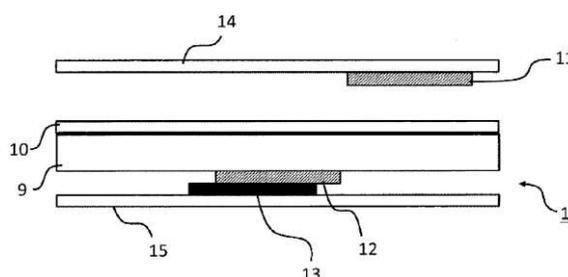
*Priority Date: 13/11/2020*

### LAMINATE, PRINT PRODUCT, AND METHOD USING LAMINATE

The present invention addresses the problem of providing a laminate, etc., capable of being used as, inter alia, an information medium for which security is improved by adding an information display that is recognizable via an infrared camera or the like while maintaining the black-colored, etc., information display of a laser coloring layer. Provided is a laminate characterized by comprising: a base material layer; a near infrared ray-absorbing layer that is formed on a first surface side of the base material layer and includes a near infrared ray-absorbing ink composition containing a near infrared ray-absorbing material; and a laser coloring layer that is formed on a second surface side of the base material layer, contains a laser coloring agent, and performs coloring by applying laser light, wherein the near-infrared ray absorbing material includes cesium tungsten oxide or lanthanum hexaboride, and applying laser light to a target portion of the near-infrared ray absorbing layer lowers near-infrared ray absorption in at least a prescribed wavelength range in the target portion.

### STRATIFIÉ, PRODUIT D'IMPRESSION ET PROCÉDÉ UTILISANT LE STRATIFIÉ

La présente invention aborde le problème de la fourniture d'un stratifié, etc., permettant d'être utilisé comme, entre autres, un support d'informations pour lequel la sécurité est améliorée par l'ajout d'un affichage d'informations qui est reconnaissable par l'intermédiaire d'une caméra infrarouge ou similaire tout en maintenant l'affichage d'informations de couleur noire, etc., d'une couche de coloration laser. Est divulgué un stratifié caractérisé en ce qu'il comprend : une couche de matériau de base ; une couche absorbant les rayons infrarouges proches qui est formée sur un premier côté de surface de la couche de matériau de base et comprend une composition d'encre absorbant les rayons infrarouges proches contenant un matériau absorbant les rayons infrarouges proches ; et une couche de coloration laser qui est formée sur un second côté de surface de la couche de matériau de base, contient un agent colorant au laser et réalise une coloration par application d'une lumière laser, le matériau absorbant les rayons infrarouges proches comprenant de l'oxyde de césium-tungstène ou de l'hexaborure de lanthane, et l'application d'une lumière laser à une partie cible de la couche absorbant les rayons infrarouges proches diminue l'absorption des rayons infrarouges proches dans au moins une plage de longueurs d'onde prescrite dans la partie cible.



**CLAIM 1.** A laminate comprising: a substrate layer; a near-infrared absorbent layer formed on a first surface side of the substrate layer, the near-infrared absorbent layer comprising a near-infrared absorbent ink composition comprising a near-infrared absorbent material; and a laser color developing layer formed on a second surface side of the substrate layer, the laser color developing layer comprising a laser color developer and developing a color by exposure to laser light, wherein the near-infrared absorbent material comprises: Cesium tungsten oxide or lanthanum hexaboride, and the near infrared radiation absorption in at least a predetermined wavelength range of a target portion of the near infrared radiation absorption layer is reduced by irradiating the target portion with laser light.

P34969

PRINTING – LABEL

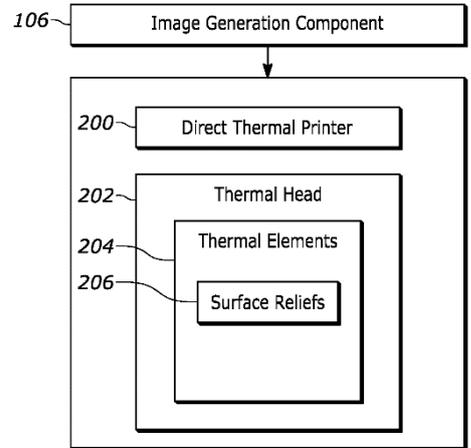
US20220161570

NANOGRAPHIX

Priority Date: 24/11/2020

METHODS AND SYSTEMS FOR GENERATING VARIABLE DIGITAL OPTICAL IMAGES ON A SUBSTRATE USING A THERMAL HEAD

A thermal printer comprising a thermal head including an array of heating elements disposed on the thermal head, the array of heating elements including optical structures comprising an array of first pixels corresponding to a first color and second pixels corresponding to a second color, the first color being different from the second color; wherein individual ones of the pixels comprise sub-pixels, a given pixel comprising a first sub-pixel and a second sub-pixel, the first sub-pixel comprising a first optical structure corresponding to light to be reflected or transmitted from a substrate toward a left eye of a person from a first viewing angle, the second sub-pixel comprising a second optical structure corresponding to light to be reflected or transmitted from a substrate toward a right eye of the person from the first viewing angle, and the first sub-pixel and the second sub-pixel correspond to the color of light of the given pixels to be reflected or transmitted from a substrate.



CLAIM 1. A thermal printer, comprising: a thermal head; an array of heating elements disposed on the thermal head; each of the heating elements including optical structures comprising an array of first pixels corresponding to a first color and second pixels corresponding to a second color, the first color being different from the second color; wherein individual ones of the pixels comprise sub-pixels, a given pixel comprising a first sub-pixel and a second sub-pixel, the first sub-pixel comprising a first optical structure corresponding to light to be reflected or transmitted from a substrate toward a left eye of a person from a first viewing angle, the second sub-pixel comprising a second optical structure corresponding to light to be reflected or transmitted from a substrate toward a right eye of the person from the first viewing angle, and the first sub-pixel and the second sub-pixel correspond to the color of light of the given pixels to be reflected or transmitted from a substrate.

P34970

CARD

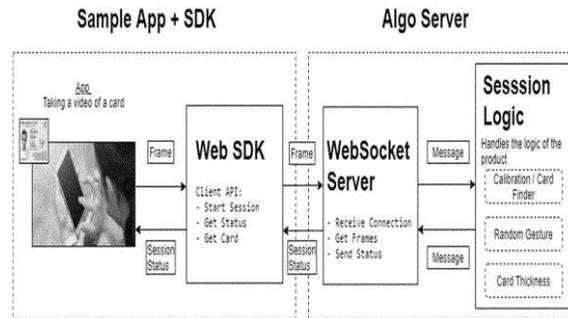
US20220139143

AU10TIX

Priority Date: 03/11/2020

SYSTEM, METHOD AND COMPUTER PROGRAM PRODUCT FOR ASCERTAINING DOCUMENT LIVENESS

A document liveness detection method comprising using a hardware processor for prompting an end-user of an electronic device, having a camera, to provide an image sequence of a physical document whose orientation is undergoing change; and image-processing the image sequence to yield an output indication of whether or not the image sequence was generated by capturing a live or physical document; and providing the output indication to at least one computerized system or human.



CLAIM 1. A document liveness detection method comprising using a hardware processor for: prompting an end-user of an electronic device, having a camera, to provide an image sequence of a physical document whose orientation is undergoing change; and image-processing the image sequence to yield an output indication of whether or not the image sequence was generated by capturing a live or physical document; and providing the output indication to at least one computerized system or human.

P34977

**PRINTING – BANKNOTE**

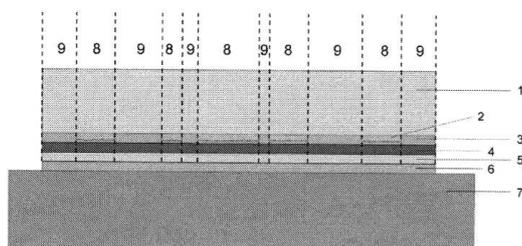
RU-210499

GOZNAK

Priority Date: 30/08/2021

**SELF-ADHESIVE FILM STRUCTURE**

A useful model can be used to mark and package products and to protect branded products from tampering and unauthorized autopsies. A layered self-adhesive film structure includes a transparent film base containing the layer of polymer carrying the hologram, a polymer layer, a colorless UV-rejected composition whose refraction indicator is the same as a polymer with a hologram, a layer of paint, and a layer of glue to secure the structure at a protected object. Also included in the structure is a layer of release which is placed between the layers of the coloring and the glue of glue, with the release layer containing sections with different degrees of adhesion to the layer of the dye, and the location of these sections relative to each other, which together form a specified invisible image for the naked eye. The technical result is reliable protection of objects by marking and packaging their layered film structures. 3 il.



**CLAIM 1.** A layered self-adhesive film structure that includes a transparent film base containing a layer of polymer carrying a hologram, a polymer layer, a colorless UV-rejected composition whose refraction indicator is the same as a polymer with a hologram, a layer of paint, and a glue layer to secure the structure in a protected object, which differs that a layer of release is included in the structure which is placed between the layers of the coloring and the glue of glue, with the release layer containing sections with different degrees of adhesion to the layer of the dye, and the location of these sections relative to each other, which together form a specified invisible image for the naked eye.

P34981

**LABEL**

KR20220065348

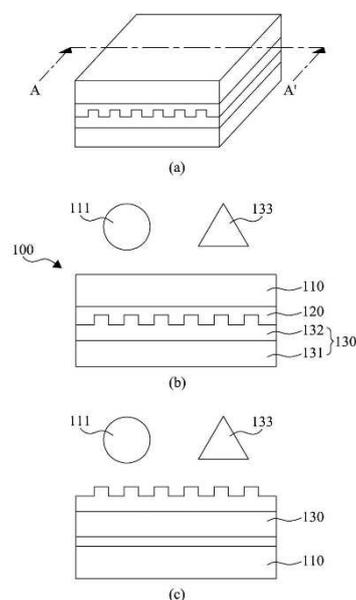
PARK, JUNG-HO | SHIN, DAE SIK

Priority Date: 13/11/2020

**HOLOGRAM COMPOSITE SHEET**

The present disclosure relates to a hologram composite sheet including: a volume hologram sheet; and a surface hologram sheet including a base material and a pattern layer, wherein the surface hologram sheet is positioned in a direction opposite to a direction in which a hologram is emitted from the volume hologram sheet based on the volume hologram sheet, and a method of manufacturing the same.

**CLAIM 1.** A hologram composite sheet comprising: a volume hologram sheet; and a surface hologram sheet including a base material and a pattern layer, wherein the surface hologram sheet is positioned in a direction opposite to a direction in which a hologram is emitted from the volume hologram sheet with reference to the volume hologram sheet.



P34982

KR20220064498

Priority Date: 12/11/2020

## FUTURE TECHNOLOGY

### AUTHENTICATION METHOD USING A COMPUTER-GENERATED HOLOGRAM

The method includes storing specific personal information, generating a first original image file including the stored specific personal information, converting the first original image file into a first digital image file using a computer generated hologram, Dividing the first digital image file into a first-first digital image file and a first-second digital image file; transmitting the first-first digital image file to the terminal according to a first request signal through the terminal of the specific individual; Merging the first-first digital image file transmitted together with the second-request signal of the specific individual through the terminal with the first-second digital image file to generate a second digital image file; restoring the second digital image file to a second original image file by using the computer-generated hologram: Comparing the reconstructed second original image file with the first original image file to determine whether the first original image file matches; and transmitting whether the second original image file matches to the corresponding terminal.

**CLAIM 1.** Storing specific personal information: generating a first original image file including the stored specific personal information: converting the first original image file into a first digital image file using a computer-generated hologram: Dividing the first digital image file into a first-first digital image file and a first-second digital image file; transmitting the first-first digital image file to the terminal according to a first request signal through the terminal of the specific individual; Merging the first-first digital image file transmitted together with the second-request signal of the specific individual through the terminal with the first-second digital image file to generate a second digital image file; restoring the second digital image file to a second original image file by using the computer-generated hologram: Comparing the reconstructed second original image file with the first original image file to determine whether the second original image file matches; and transmitting whether the second original image file matches to the corresponding terminal.



P35007

## BRAND PROTECTION

IN202011037550

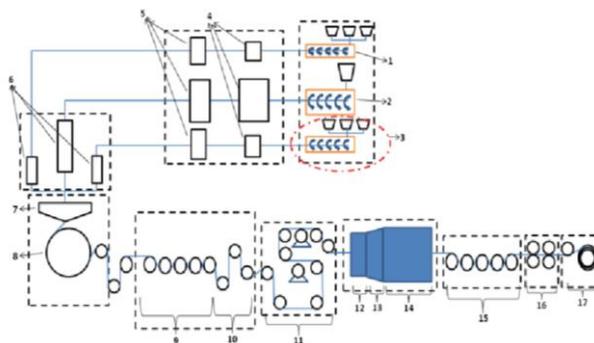
Priority Date: 31/08/2020

BHATT PANKAJ

### METHOD FOR MAKING A HOLOGRAPHIC FLEXIBLE LAMINATE

A Flexible multilayer holographic barrier laminate sheet, particularly an biaxially oriented metalized holographic polyester based laminate comprises the inner most layer of the laminate body will be a layer that is bondable to an outer layer, and further in process of making a tube is bondable with the shoulder of the tube. It should also be bondable to the inner most layer in order to form the longitudinal seal of the tube body. The inner most layer and the outer most layer preferably are polyene layers. Polyenes form good heat bonds, and in particular, polyene to polyene bonds. Therefore, it is preferred that in addition to the inner layer and the outer layer, that the shoulder also be comprised of a polyene. The tube made of laminate material reveals the squeezability, shape retention and durability, for example toothpaste tubes, as required to dispense products from a tube opening with the application of manual squeezing forces.

**CLAIM 1.** The flexible laminate for packaging, the laminate comprises of: - layer A suitable for embossing which is a made of copolymer of polyester or a blend of homopolymer and copolymer of polyester, wherein layer A comprises of A1: Adhesion promoting coating layer; A2: Coextruded polyester layer; A3: Homo polyester layer; A4: Homo Polyester or Copolyester layer; A5: Adhesion promoting coating, and an Ink/pattern layer, a Reflective metal layer and an adhesive layer - layer B which is made of polyolefin wherein layer B is comprises of B1: Polyethylene layer; B2: Tie layer; B3: EVOH layer; B4: Tie layer; B5: Polyethylene layer; wherein the laminate is a biaxially oriented holographic polyester film.



P35008

**BRAND PROTECTION**

IN202011037548

BHATT PANKAJ

Priority Date: 31/08/2020

**A METHOD OF MAKING A HOLOGRAPHIC BARRIER TUBES AND A HOLOGRAPHIC TUBE THEREOF**

A Flexible multilayer holographic barrier laminate sheet, particularly an biaxially oriented metalized holographic polyester based laminate comprises the inner most layer of the laminate body will be a layer that is bondable to an outer layer, and further in process of making a tube is bondable with the shoulder of the tube. It should also be bondable to the inner most layer in order to form the longitudinal seal of the tube body. The inner most layer and the outer most layer preferably are polyene layers. Polyenes form good heat bonds, and in particular, polyene to polyene bonds. Therefore, it is preferred that in addition to the inner layer and the outer layer, that the shoulder also be comprised of a polyene. The tube made of laminate material reveals the squeezability, shape retention and durability, for example toothpaste tubes, as required to dispense products from a tube opening with the application of manual squeezing forces.

**CLAIM 1.** A method of making a holographic tube, wherein the tube is manufactured in steps, comprising: a) rolling the laminate in cylindrical tube form and overlapping of inner and outer polyolefin layers to form a longitudinal directional lap seal in a portion along length of the tube by application of heat and pressure b) Cutting the long cylindrical tube in to small length c) polyolefin resin spray over the extended portion of mandrel over the wrapped tube around the mandrel d) Injection molding and sealing of tube shoulder across the circular top edge of tube e) Shoulder head sealing and cap fixing f) Filling and punching the cylindrical tube in to crosswise direction to overlap atleast a portion of laminate to bond sealing layer to form a fin seal by application of heat and pressure.

P35019

**PRINTING – CARD – PASSPORT**

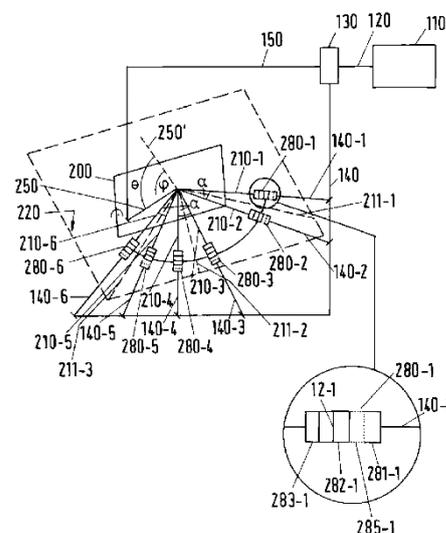
EP3995904

BUNDESDRUCKEREI

Priority Date: 04/11/2020

**METHOD FOR PRODUCING A SECURITY HOLOGRAM AND SECURITY HOLOGRAM**

The invention relates to a method for producing a security hologram (201) and to a security hologram (201) produced in this way. The method comprises the steps of: providing a plurality of, at least three, monoscopic images (12-x) of a three-dimensional object (5) from different detection directions (12-x), wherein exactly one of the different detection directions (12-x) is assigned to each of the plurality of images (12-x), providing a holographic recording material (200); Generating coherent light (120) and splitting the coherent light (120) into at least one reference portion (150; 150-x) and at least one object portion (140; 140-x); and guiding the at least one reference portion (150; 150-x) and the at least one object portion (140; 140-x) such that the at least one object portion (140'; 140-x) and the at least one reference portion (150; 150-x) radiate through the recording material (200) from opposite sides and interfere in the interior of the recording material (200), wherein the plurality of images (12-x) are projected under different exposure directions (210-x) with respect to the recording material (200), wherein exactly one of the different exposure directions (210-x) is assigned to each of the plurality of images (12-x), characterized in that the exposure directions (210-x) all lie in one plane and at least pairwise enclose a standard convergence angle (a) for human observation, so that a stereoscopic effect is perceptible to a human observer.



**CLAIM 1.** Method for producing a security hologram (201), comprising the steps of: providing a plurality of, at least three, monoscopic images (12-x) of a three-dimensional object (5) from different detection directions (10-x), wherein exactly one of the different detection directions (10-x) is assigned to each of the plurality of images (12-x), providing a holographic recording material (200); generating coherent light (120) and splitting the coherent light (120) into at least one reference portion (150; 150-x) and at least one object portion (140; 140-x); and guiding the at least one reference portion (150; 150-x) and the at least one object portion (140'; 140-x) such that the at least one object portion (140'; 140-x) and the at least one reference portion (150; 150-x) radiate through the recording material (200) from opposite sides and interfere inside the recording material (200), wherein the plurality of images (12-x) are projected under different exposure directions (210-x) with respect to the recording material (200), wherein exactly one of the different exposure directions (210-x) is assigned to each of the plurality of images (12-x), characterized in that In that the exposure directions (210-x) all lie in one plane and enclose at least in pairs a standard convergence angle (a) for human observation from a standard distance, so that a stereoscopic effect can be perceived for a human observer with a standard eye distance during reconstruction.

P35020

PRINTING – CARD – MAGNETISM

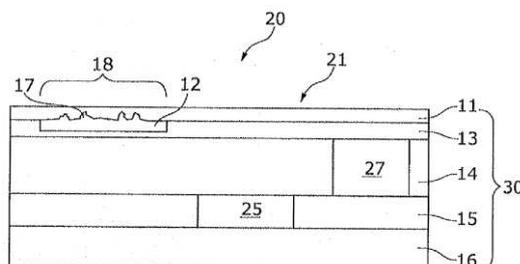
EP3995318

BUNDESDRUCKEREI

Priority Date: 06/11/2020

DATA CARRIER FOR A SECURITY OR VALUE DOCUMENT WITH A MAGNETIC SECURITY FEATURE

The invention relates to a data carrier (20) for a security or value document (32), which has a plurality of layers (11, 12, 13, 14, 15, 16) and security features (25, 26, 27, 28), wherein at least one layer is a magnetic layer (12), the layers (11, 12, 13, 14, 15, 16) form a composite body (30) and the magnetic layer (12) has three-dimensional, topologically protected magnetic structures (17), wherein the magnetic structures (17) are skyrmions. (In this context, Figure 1)



**CLAIM 1.** A data carrier (20) for a security or value document (32), comprising a plurality of layers (11, 12, 13, 14, 15, 16) and security features (25, 26, 27, 28), wherein at least one layer is a magnetic layer (12), the layers (11, 12, 13, 14, 15, 16) form a composite body (30) and the magnetic layer (12) has three-dimensional, topologically protected magnetic structures (17), characterized in that the magnetic structures (17) are skyrmions.

P35022

BANKNOTE – CARD – SMARTPHONE AUTHENTICATION

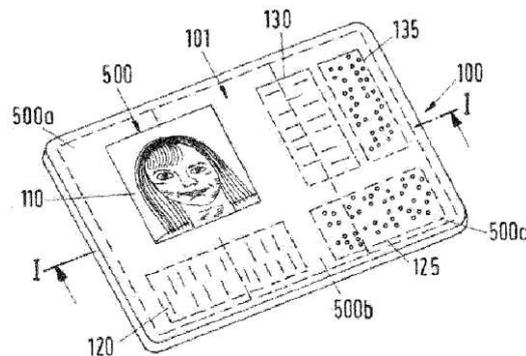
EP3989187

BUNDESDRUCKEREI

Priority Date: 22/10/2020

METHOD FOR VERIFYING THE AUTHENTICITY OF A SECURITY FEATURE OF A VALUE OR SECURITY PRODUCT FORMED FROM SEVERAL PARTS

The invention relates to a method for verifying the authenticity of a security feature (500) of a valuable or security product (100), said security feature being formed from a plurality of feature parts (500 a, 500 b, 500 c) and thus having at least two different optically activatable states, using a mobile terminal (200), which has at least one light source (201) and at least one image sensor (204), comprising the steps of: - irradiating the security feature (500) with the at least one light source (201) of the mobile terminal (200) at a first angle, whether a first optically active state of the security feature (500) has thereby been caused and detected by the image sensor (204), - irradiating the security feature (500) with the at least one light source (201) of the mobile terminal (202) at a second angle deviating from the first angle or irradiating the security feature (500) with a second light source (202), whether at least one second optically active state of the security feature (500) was thereby caused and detected by the image sensor (204), and - determining a product forgery if one of the optically active states could not be detected or could not be completely detected by the image sensor (204).



**CLAIM 1.** A method for authenticity verification of a security feature (500) of a valuable or security product (100) formed from a plurality of feature parts (500 a, 500 b, 500 c) and thereby having at least two different optically activatable states using a mobile terminal (200), which has at least one light source (201) and at least one image sensor (204), comprising the steps of:- Irradiating the security feature (500) with the at least one light source (201) of the mobile terminal (200) at a first angle and checking whether a first optically active state of the security feature (500) has thereby been caused and detected by the image sensor (204), - Irradiating the security feature (500) with the at least one light source (201) of the mobile terminal (202) at a second angle deviating from the first angle or irradiating the security feature (500) with a second light source (202), whether at least one second optically active state of the security feature (500) has thereby been caused and detected by the image sensor (204), and - Determining a product forgery if one of the optically active states could not be detected by the image sensor (204) or could not be detected completely.

P35024

CARD

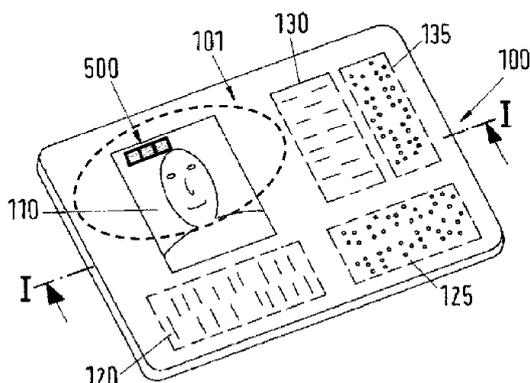
EP3989007

BUNDESDRUCKEREI

Priority Date: 22/10/2020

**VALUABLE OR SECURITY PRODUCT AND METHOD FOR VERIFYING THE SAME**

The invention relates to a value or security product (100), in particular an identity card, comprising a hologram region (502) which comprises a first volume reflection hologram (500 a) and a second volume reflection hologram (500 b). The first volume reflection hologram (500 a) is configured to reconstruct a beam direction at a first reconstruction wavelength and a first reconstruction beam direction, and the second volume reflection hologram (500 b) is configured to reconstruct a beam direction at a second reconstruction beam direction that differs from the first reconstruction beam direction. The invention also relates to a method for verifying the authenticity of the valuable or security product (100).



**CLAIM 1.** Value or security product (100), in particular identity card, which has a hologram region (502) which comprises a first volume reflection hologram (500 a) and a second volume reflection hologram (500 b), characterized in that the first volume reflection hologram (500 a) is configured to reconstruct a beam direction at a first reconstruction wavelength and a first reconstruction beam direction, and that the second volume reflection hologram (500 b) is configured to reconstruct a beam direction at a second reconstruction beam direction deviating from the first reconstruction beam direction.

P35026

LABEL – TAMPER EVIDENCE – RFID

DE102020129468

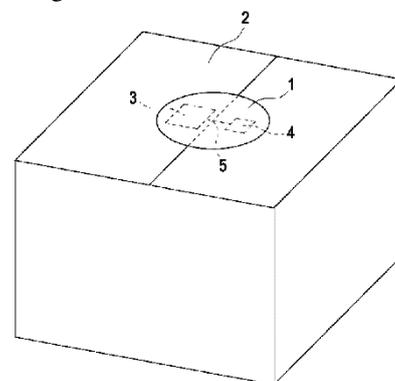
BCTSL SERVICES

Priority Date: 09/11/2020

**SECURITY LABEL**

The invention relates to a security label (1) for protecting valuables (2) of any type against forgery or unauthorized opening thereof. for this purpose, the security label (1) is irreversibly connected to the valuables (2) in such a way that the security label (1) is fixed to the valuables (2). in such a way that opening of the packaging or of the object of value (2) itself is no longer possible without damaging the security label (1) in question. For this purpose, the security label (1) comprises a sealing film which is engaged from below by an adhesive or adhesive area on the underside, wherein at least one NFC chip with at least one antenna (4) for receiving the data transmitted by an authorized Transponder and/or for reading out the data stored in the NFC chip (3) is provided in said intermediate area.

**CLAIM 1.** A security label for securing valuable articles (2) of any desired type against forgery or unauthorized opening, wherein the security label (1) is irreversibly connected, preferably adhesively bonded, to the valuable article (2) in such a way that opening of the packaging or of the valuable article (2) itself is not possible without damage to the security label (1), characterized in that the security label (1) comprises a sealing film with an adhesive on the underside, wherein an NFC chip (3), in particular an RFID chip, is arranged in the intermediate region between the region of the object of value (2) covered by the sealing film and the sealing film, , having at least one antenna, preferably two antennas (4, 4'), which is suitable for receiving the data transmitted by an authorized Transponder and/or for reading out the data stored in the NFC chip (3).



P35036

CN216507550U

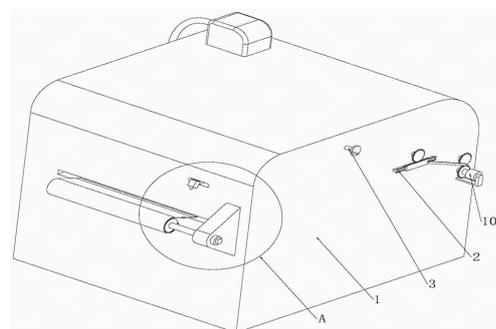
Priority Date: 02/12/2021

GUANGDONG RUIXIANG SHANGCAI TECHNOLOGY

### HOLOGRAPHIC POSITIONING ANTI-COUNTERFEITING HOT STAMPING FILM PROCESSING DEVICE

The utility model relates to the technical field of thermoprinting film processing, in particular to a holographic positioning anti-counterfeiting thermoprinting film processing device which comprises a processing box, wherein one side of the processing box is fixedly connected with a fixing plate, one side of the fixing plate is fixedly connected with a driving motor, the output end of the driving motor is connected with a driving shaft through a coupler, the inner wall of one side of the processing box is provided with a rotating hole, and one end of the driving shaft penetrates through the rotating hole and is rotatably connected to the inner wall of the other side of the processing box; the hot stamping film drying device can drive the driving shaft and the driving gear to rotate through the driving motor, the driving gear drives the driven gear to rotate, the driven gear drives the sliding plate and the fixed rack to reciprocate through the connecting rod, the fixed rack moves to drive the rotating gear, the swinging shaft and the blowing pipe to swing, the blowing pipe swings to expand the blowing range of a hot stamping film, the hot stamping film can be uniformly dried, the drying effect of the hot stamping film is improved, and the quality of a product is further improved.

**CLAIM 1.** The utility model provides an anti-fake thermoprint membrane processing equipment of holographic location, includes processing case (1), its characterized in that: one side of the processing box (1) is fixedly connected with a fixing plate, one side of the fixing plate is fixedly connected with a driving motor (101), the output end of the driving motor (101) is connected with a driving shaft (102) through a coupler, the inner wall of one side of the processing box (1) is provided with a rotating hole, one end of the driving shaft (102) penetrates through the rotating hole and is rotatably connected with the inner wall of the other side of the processing box (1), the inner walls of two sides of the processing box (1) are provided with mounting holes, two mounting holes are rotatably connected with driven shafts, conveying rollers are fixedly sleeved on the driving shaft (102) and the driven shafts, a driving gear (103) and a driven gear (104) are respectively in keyed connection on the driving shaft (102) and the driven shafts, the driving gear (103) is meshed with the driven gear (104), the inner walls of two sides of the processing box (1) are fixedly connected with a cross beam (303), and a sliding adjusting mechanism is installed on the cross beam (303), the processing box (1) is provided with an even drying mechanism.



P35037

PASSPORT

CN216490680U

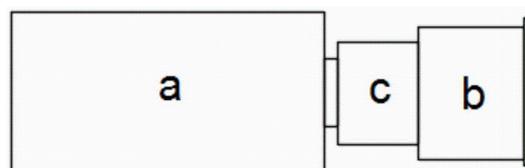
Priority Date: 07/06/2021

SHENYANG BOXING YADA TECHNOLOGY

### CAMERA DEVICE, AND LASER HOLOGRAPHIC IMAGING DEVICE AND SYSTEM ADOPTING SAME

The utility model discloses a camera device, a laser holographic imaging device and a laser holographic imaging system adopting the same, wherein the camera device comprises a camera device element and a lens connected with the camera device element; the camera element is a CCD element or a CMOS element, the camera element is a large target surface camera element with the length of more than 1 inch, and the lens adopts one of a lens with the focal length of less than 35mm, a lens with the focal length of 50mm or 85mm, a lens with the focal length of 100mm or 135mm, a zoom lens with the focal length of 24-105mm and a lens with the focal length of 24-75 mm. The holographic imaging detection device comprises: each group of detection light sources comprises at least one lamp bead, and the detection light sources are used for emitting detection illumination light and realizing gradual change of illumination angles of the detection illumination light on an imaging object according to a sequence; and the camera device is used for receiving the light projected by the imaging object irradiated by the detection light source and obtaining image data formed by light interference.

**CLAIM 1.** An image pickup apparatus characterized in that: the device comprises an image pickup device element and a lens connected with the image pickup device element; the camera element is a CCD element or a CMOS element, the camera element is a large target surface camera element with the length of more than 1 inch, and the lens adopts one of a lens with the focal length of less than 35mm, a lens with the focal length of 50mm or 85mm, a lens with the focal length of 100mm or 135mm, a zoom lens with the focal length of 24-105mm and a lens with the focal length of 24-75 mm.





P35039

**BRAND PROTECTION – THERMOCHROMY**

CN216487000U

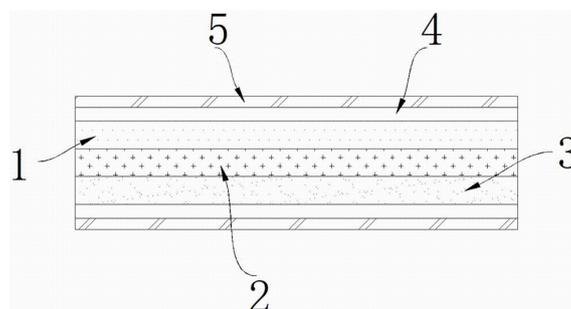
SHENZHEN JINSHENGCAI PACKAGING MATERIAL

Priority Date: 22/06/2021

**HOLOGRAPHIC RECORDING PHOTSENSITIVE ANTI-COUNTERFEITING POLYMERIZED PAPER**

The utility model discloses holographic recording photosensitive anti-counterfeiting polymerized paper which comprises an anti-counterfeiting pattern layer, an aluminum foil layer and a raw paper layer, wherein the aluminum foil layer is arranged at one end of the raw paper layer and is bonded on the surface of one end of the raw paper layer, the anti-counterfeiting pattern layer is arranged at one end of the aluminum foil layer and is bonded on the surface of one end of the aluminum foil layer, base film layers are respectively arranged at one end of the anti-counterfeiting pattern layer and the other end of the raw paper layer, and the base film layers are bonded on one end of the anti-counterfeiting pattern layer and the other end of the raw paper layer. According to the utility model, the third microcapsules are uniformly arranged in the anti-counterfeiting pattern layer, the third microcapsules, the second microcapsules and the first microcapsules are filled with the temperature-variable color coatings with different colors, and the third microcapsules, the second microcapsules and the first microcapsules are arranged according to a specific sequence to form a color temperature-variable anti-counterfeiting pattern, so that the color is richer, and the anti-counterfeiting strength can be enhanced to a certain extent.

**CLAIM 1.** Holographic recording sensitization anti-fake polymeric paper, including anti-fake pattern layer (1), aluminium foil layer (2) and raw paper layer (3), its characterized in that: an aluminum foil layer (2) is arranged at one end of the raw paper layer (3), and the aluminum foil layer (2) is bonded on the surface of one end of the raw paper layer (3); an anti-counterfeiting pattern layer (1) is arranged at one end of the aluminum foil layer (2), and the anti-counterfeiting pattern layer (1) is adhered to the surface of one end of the aluminum foil layer (2); base film layer (4) are all installed to the one end of anti-fake pattern layer (1) and the other end of raw paper layer (3), and base film layer (4) bonding is on the one end of anti-fake pattern layer (1) and the other end of raw paper layer (3), the inside of anti-fake pattern layer (1) evenly is provided with temperature change structure (7).



P35049

**PRINTING - BRAND PROTECTION – RELIEF**

CN216456834U

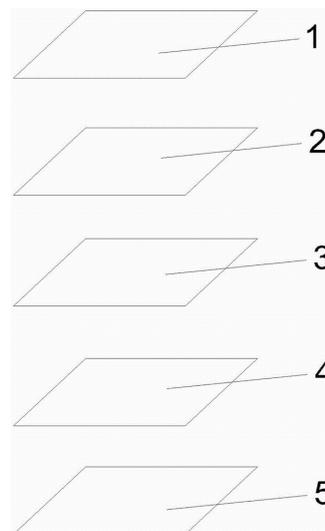
HOLOTEK TECHNOLOGY

Priority Date: 16/11/2021

**PHOTOETCHING RELIEF LASER HOLOGRAPHIC PATTERN STRUCTURE AND GAME CARD**

The utility model discloses a photoetching relief laser holographic pattern structure and a game card, and aims to provide a photoetching relief laser holographic pattern structure which is simple in structure and low in processing cost. The UV-printing ink comprises a base film layer, a UV coating layer, a photoetching relief laser holographic pattern layer and an ink layer which are sequentially laminated, wherein a deposition layer is arranged between the pattern layer and the ink layer, and the deposition layer is an aluminum layer or a zinc sulfide medium layer. The utility model is applied to the technical field of laser packaging.

**CLAIM 1.** A photoetched relief laser holographic pattern structure is characterized in that: the laser holographic pattern layer comprises a base film layer (1), a UV coating layer (2), a photoetching relief laser holographic pattern layer (3) and an ink layer (5) which are sequentially stacked, wherein a deposition layer (4) is arranged between the pattern layer (3) and the ink layer (5), and the deposition layer (4) is an aluminum layer or a zinc sulfide medium layer.



P35052

LABEL

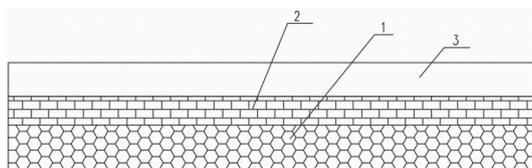
CN21638852U

SHENZHEN CRYSTAL SOURCE LASER TECHNOLOGY PRODUCT

Priority Date: 18/11/2021

### 360-DEGREE OPTICAL ZOOMING TECHNOLOGY MARK

The utility model relates to the technical field of anti-counterfeiting marks, and discloses a 360-degree optical zooming technical mark, which comprises a substrate layer, an anti-counterfeiting mark layer and a performance layer, wherein the top of the substrate layer and the bottom of the anti-counterfeiting mark layer are arranged through an adhesive, the top of the anti-counterfeiting mark layer and the bottom of the performance layer are arranged through an adhesive, the anti-counterfeiting mark layer comprises an imaging layer, an aluminum-plated layer and a rainbow holographic pattern layer, the top of the imaging layer and the bottom of the aluminum-plated layer are arranged, the top of the aluminum-plated layer and the bottom of the rainbow holographic pattern layer are arranged, the performance layer comprises a release film layer, a bright sheet layer, a glue bonding layer and a protective layer, the utility model sets a laser holographic pattern on the imaging layer through the imaging layer, the aluminum-plated layer and the rainbow holographic pattern layer, the aluminum-plated layer surface is provided with an aluminum-plated film, the rainbow holographic pattern layer is partially smooth and can be seen as an anti-counterfeiting mark, the effect of convenient use is achieved.



**CLAIM** 1.360 degree optics focus becomes technical mark, including substrate layer (1), false proof mark layer (2) and performance layer (3), its characterized in that: the top of the substrate layer (1) and the bottom of the anti-counterfeiting mark layer (2) are arranged through an adhesive, the top of the anti-counterfeiting identification layer (2) and the bottom of the performance layer (3) are arranged through an adhesive, the anti-counterfeiting mark layer (2) comprises an imaging layer (201), an aluminum plating layer (202) and a rainbow holographic grain layer (203), the top of the imaging layer (201) is arranged at the bottom of the aluminum plating layer (202), the top of the aluminum plating layer (202) is arranged at the bottom of the rainbow holographic pattern layer (203), the performance layer (3) comprises a release film layer (301), a paillette layer (302), a glue bonding layer (303) and a protective layer (304), the top of the release film layer (301) and the bottom of the bright sheet layer (302) are arranged, the top of the bright sheet layer (302) is arranged with the bottom of the glue adhesion layer (303), the top of the glue adhesion layer (303) is arranged with the bottom of the protection layer (304).

P35054

PRINTING – LABEL

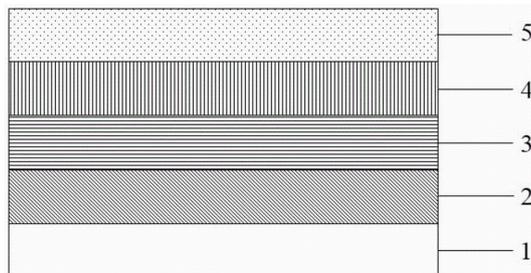
CN114525701

GUANGZHOU HUADU LIANHUA PACKING MATERIAL

Priority Date: 01/03/2022

### DYNAMICALLY DRIFTING SEAL PAPER

The invention discloses a dynamically drifting seal paper, which comprises a raw paper layer, an information layer, an aluminum plating layer, a dynamic image-text layer and a protective layer which are sequentially arranged; the information layer is arranged on the upper surface of the raw paper layer; the aluminized layer is arranged on the upper surface of the information layer, and the dynamic image-text layer is arranged on the upper surface of the aluminized layer; the protective layer is arranged on the upper surface of the dynamic image-text layer. The sealing paper disclosed by the invention combines a vacuum aluminum plating technology with a dynamic image-text pressing technology, the appearance of the product presents a holographic effect, the encrypted image-text is displayed under the irradiation of a strong light source, the dynamic image-text effect is presented along with the movement of the light source, and the attractiveness and the anti-counterfeiting performance of the sealing paper are improved.



**CLAIM** 1. The dynamically drifting seal paper is characterized by comprising a raw paper layer, an information layer, an aluminum-plated layer, a dynamic image-text layer and a protective layer which are sequentially arranged from bottom to top.

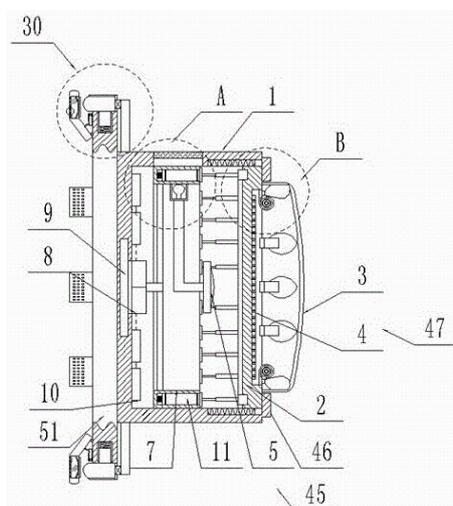
**NICKEL-FREE WIDE-WIDTH FILM PRESSING FILM AND PROCESSING TECHNOLOGY THEREOF**

The invention discloses a nickel-free wide-width film pressing film and a processing technology thereof; the method utilizes a traditional nickel plate for printing as a mother plate, uses a PET (polyethylene terephthalate) base film and thermosetting acrylic resin as matrixes, and copies holographic light pattern information on the nickel plate on a film-pressing mother plate after mould pressing, and carries out vacuum metal layer plating and polybenzoxazine resin layer preparation on the holographic light pattern information to enhance the strength and reduce the surface energy of the holographic light pattern information and reduce the adhesive force; then preparing a wide-width film pressing belt, reprinting the holographic optical pattern information on the film pressing mother board on the wide-width film pressing belt again to make the holographic optical pattern information identical to that of the nickel plate, thereby achieving the purpose that the printed pattern on the paper is consistent with that of the nickel plate, and simultaneously, in order to further enhance the interlayer bonding capability of the wide-width film pressing belt, the invention also carries out corona treatment on the benzoxazine resin layer to enhance the surface roughness thereof, so that the service life of the wide-width film pressing belt is prolonged.

**CLAIM 1.** A processing technology of a nickel-free wide film pressing film is characterized by comprising the following steps: s1, preparing a nickel plate mother board according to required holographic light pattern information; s2, cutting the PET base film to enable the width of the PET base film to be the same as that of the nickel plate mother board, coating thermosetting acrylic resin on the PET base film, installing the nickel plate mother board on a mould press, heating to 80-100 , and carrying out mould pressing; s3, moving the molded PET base film into a vacuum coating machine, evaporating to prepare a metal adhesion layer, spraying a benzoxazine solution on the surface of the metal adhesion layer, placing the metal adhesion layer into a drying box, drying at the temperature of 120-140 for 3-5min, and taking out to prepare a benzoxazine anti-adhesion layer to obtain a pressed film master plate; s4, opening a roller machine, installing a film pressing mother board and a wide film pressing belt on the roller machine, preheating the film pressing mother board and the wide film pressing belt during working, preparing holographic light pattern information on the surface of the wide film pressing belt in a mode that working rollers mutually press against each other, and carrying out corona treatment on the holographic light pattern information by using a corona treatment device; the preparation method of the wide-width film laminating belt comprises the following steps: cutting the PET base film, and coating benzoxazine resin on the PET base film to obtain a wide film pressing belt; and S5, carrying out vacuum aluminizing on the wide-width film pressing belt to obtain the nickel-free wide-width film pressing belt.

**HOLOGRAPHIC ANTI-COUNTERFEIT LABEL**

The invention discloses a holographic anti-counterfeiting label, which comprises: the anti-counterfeiting label comprises an installation ring, an attaching adhesive plate, a pressing circular plate and an anti-counterfeiting label assembly, wherein the attaching adhesive plate is fixedly connected to the left side of the installation ring, and the pressing circular plate is connected to the right side of the installation ring in an embedded mode; the upper inner wall and the lower inner wall of the mounting ring are both horizontally provided with strip-shaped sliding grooves, and the pressing circular plate is connected with the strip-shaped sliding grooves in a sliding manner; the anti-counterfeiting label assembly is connected to the outer end face of the pressing circular plate; the anti-counterfeiting label component is provided with an anti-counterfeiting number. According to the invention, the micro stepping motor in the label switches one pigment cavity to the lamp bead every day, and the colors in each pigment cavity are different from each other, so that the color corresponding to the anti-counterfeiting number of the anti-counterfeiting label is changed along with the change of the date, and the official background of the commodity records when the pigments in the label are sequenced out of the field, and is synchronized along with the time, so that the authenticity inquiry can be ensured, and the anti-counterfeiting effect is enhanced.



**CLAIM 1.** A holographic security label, comprising: the anti-counterfeiting label comprises an installation circular ring (1), an attaching adhesive plate (51), a pressing circular plate (2) and an anti-counterfeiting label assembly (47), wherein the attaching adhesive plate (51) is fixedly connected to the left side of the installation circular ring (1), and the pressing circular plate (2) is connected to the right side of the installation circular ring (1) in a jogged mode; the upper inner wall and the lower inner wall of the mounting ring (1) are both horizontally provided with strip-shaped sliding grooves (33), and the pressing circular plate (2) is connected with the strip-shaped sliding grooves (33) in a sliding manner; a first spring (34) is connected between the strip-shaped sliding groove (33) and the pressing circular plate (2); the anti-counterfeiting label assembly (47) is connected to the outer end face of the pressing circular plate (2); the anti-counterfeiting label assembly (47) is provided with an anti-counterfeiting number, and the installation ring (1) is internally provided with a regular switching mechanism (45); the periodic switching mechanism (45) includes: the device comprises a micro stepping motor (8), a rotating ring (7), a through hole (55), a light-transmitting plate (35), a fixed lamp arm (54), a power-on key switch (5), a lamp bead (6), a battery pack (10), a timing starting controller (9) and a pigment cavity (11); the miniature stepping motor (8) is fixedly connected into the installation ring (1), the rotating ring (7) is arranged inside the installation ring (1), the rotating ring (7) is fixedly connected with a main shaft end of the miniature stepping motor (8), the timing starting controller (9) is embedded into the bonding adhesive plate (51), the battery pack (10) is installed in the installation ring (1), and the timing starting controller (9), the battery pack (10) and the miniature stepping motor (8) are electrically connected; the pigment cavities (11) are distributed on the rotating ring (7) in a surrounding and equidistant mode, and the rotating ring (7) is made of light-transmitting materials; the fixed lamp arm (54) is fixedly connected with the installation ring (1), one end of the fixed lamp arm (54) is fixedly provided with the lamp bead (6), the other end of the fixed lamp arm (54) is fixedly provided with the power-on key switch (5), and the power-on key switch (5) is electrically connected with the lamp bead (6); the through hole (55) is formed in the upper side wall of the mounting ring (1), and the light-transmitting plate (35) is embedded in the through hole (55).

P35075

**LABEL**

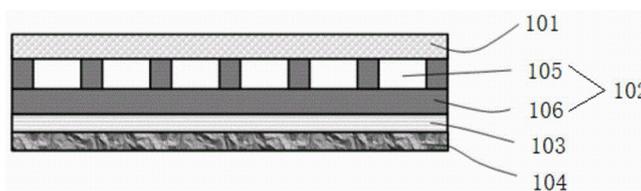
CN114419984

Priority Date: 16/02/2022

WUHAN HUAGONG IMAGE TECHNOLOGY & DEVELOPMENT

**COLORFUL HOLOGRAPHIC ANTI-COUNTERFEITING MARK FILM AND PREPARATION METHOD THEREOF**

The application discloses a colorful holographic anti-counterfeiting mark film and a preparation method thereof, wherein the holographic anti-counterfeiting mark film comprises a base film layer, an anti-counterfeiting pattern layer, a coating layer and a non-setting adhesive layer which are sequentially stacked, wherein the anti-counterfeiting pattern layer comprises a first holographic color layer and a second holographic color layer; wherein the base film layer exhibits a first predetermined color; the first holographic color layer is attached to the surface of the base film layer and has a local hollow structure, and a non-hollow area of the first holographic color layer presents a second preset color; the second holographic color layer is partially filled in the hollow area of the first holographic color layer and is contacted with the base film layer, and the second holographic color layer presents a third preset color; the colors of the base film layer, the first holographic color layer and the second holographic color layer are overlapped, so that the colorful holographic anti-counterfeiting mark film displays different colors before and after the base film layer is uncovered; the holographic anti-counterfeiting mark film has a colorful color spreading effect through a special color spreading structure, so that the anti-counterfeiting strength of the product is improved, and the imitation difficulty is greatly improved.



P35078

**PRINTING – LABEL**

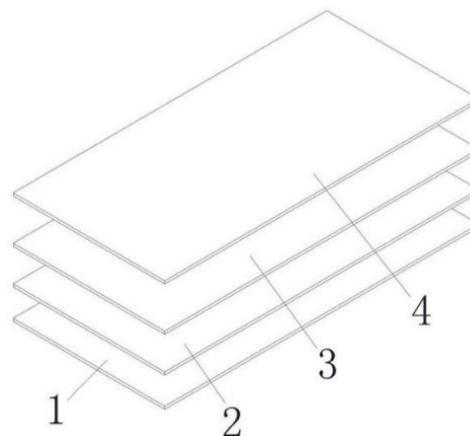
CN114411096

Priority Date: 24/01/2022

GUANGDONG RUIXIANG SHANGCAI TECHNOLOGY

**LASER HOLOGRAPHIC ANTI-COUNTERFEITING COMPOSITE ALUMINIZER AND PRODUCTION PROCESS THEREOF**

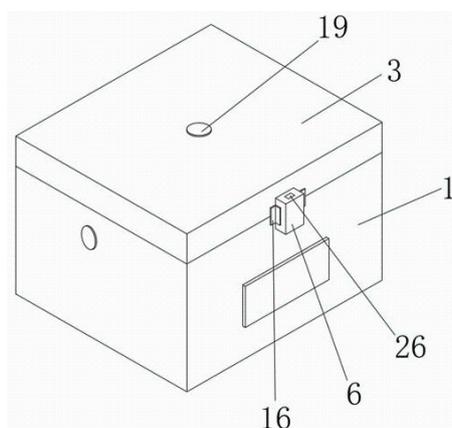
The invention relates to the technical field of aluminizer production, in particular to a laser holographic anti-counterfeiting composite aluminizer and a production process thereof, wherein the laser holographic anti-counterfeiting composite aluminizer comprises a base film layer, an aluminizer layer is arranged on the upper surface of the base film layer, a printing layer is arranged on the upper surface of the aluminizer layer, a gluing layer is arranged on the upper surface of the printing layer, and the production process of the laser holographic anti-counterfeiting composite aluminizer comprises the following steps of S1: the method comprises the steps of aluminizing a base material, placing a reel film in a vacuum chamber, closing the vacuum chamber and vacuumizing, heating an evaporation boat to 1300-1400 °C, then continuously conveying an aluminum wire with the purity of 99.9% onto the evaporation boat, adjusting the unwinding speed, the winding speed, the wire feeding speed and the evaporation amount, and opening a cooling source to continuously melt and evaporate the aluminum wire on the evaporation boat, so that a bright aluminum layer is formed on the surface of a moving film after cooling, namely the aluminized film, and the prepared aluminized label is subjected to die pressing, code printing and gluing to be prepared into the aluminized film with the anti-counterfeiting label.



**CLAIM 1.** The utility model provides a compound aluminizer of laser holography anti-fake, includes base film layer (1), its characterized in that: the upper surface of base film layer (1) is provided with aluminized layer (2), the upper surface of aluminized layer (2) is provided with prints layer (3), the upper surface of printing layer (3) is provided with rubber coating (4).

**ANTI-FAKE GIFT BOX**

The invention discloses an anti-counterfeiting gift box, which relates to the field of gift boxes and comprises a gift box main body, wherein the top of the gift box main body is opened and fixedly connected with a convex edge sealing piece, the convex edge sealing piece is detachably connected with a box cover for sealing the top opening of the gift box main body, and the front surface and the back surface of an inner cavity of the box cover are both provided with first through holes. Through transparent polyvinyl chloride antifalsification label, the effect of humanized information printing has been played with the gift box main part to the lid when using, and for the holographic film of full transparent laser, not only can not harm global design scheme and original actual effect, but also can improve the function of false proof mark, make the mark humanized, through compound antifalsification label, anti-fake two-dimensional code figure and from type paper, play the effect that prevents the dismantlement to gift box main part and theftproof shell in use, printable trade mark on the compound antifalsification label wherein, word description and bar code, glue and can not open in detail on gift box main part and theftproof shell, in case open, the paper will fracture, can effectively discern the true and false.



**CLAIM 1.** The utility model provides an anti-fake gift box, includes gift box main part (1), its characterized in that: the gift box comprises a gift box body (1), wherein the top of the gift box body (1) is open and fixedly connected with a convex edge sealing element (2), the convex edge sealing element (2) is detachably connected with a box cover (3) for sealing the top of the gift box body (1), the front and back of an inner cavity of the box cover (3) are both provided with first through holes (4), the front and back of the convex edge sealing element (2) are both provided with second through holes (5) corresponding to the first through holes (4), the top of the front and back of the gift box body (1) are both fixedly connected with an anti-theft shell (6), the inner side of the anti-theft shell (6) is provided with a through hole (7), the bottom of the inner cavity of the anti-theft shell (6) is fixedly connected with a supporting block (8), the top of the supporting block (8) is provided with a cutting groove (9), and the top of the anti-theft shell (6) is provided with a groove (10), a pressure plate (11) is arranged in the inner cavity of the groove (10), the bottom of the pressure plate (11) is fixedly connected with a pressure rod (12), the bottom of the pressure lever (12) downwards penetrates through the anti-theft shell (6) and is fixedly connected with a moving plate (13), the bottom of the moving plate (13) is fixedly connected with a cutter (30) matched with the cutting groove (9), the front and the back of the inner cavity of the box cover (3) are both provided with plastic stop blocks (14), the outer side of the plastic stop block (14) is fixedly connected with a round plastic connecting piece (15), the outer side of the round plastic connecting piece (15) outwards penetrates through the anti-theft shell (6), the joint of the inner sides of the two sides of the anti-theft shell (6) and the two sides of the front surface and the two sides of the back surface of the gift box main body (1) are respectively bonded with a composite anti-counterfeiting label (16), transparent polyvinyl chloride anti-counterfeiting labels (19) are bonded to the top of the box cover (3) and the tops of the two sides of the gift box main body (1).

*Click on the title to return to table of contents*

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

**P34930**

**PRINTING – BANKNOTE – CARD – THREAD – INFRARED – LUMINESCENCE**

**WO2022106809**

Priority Date: 17/11/2020

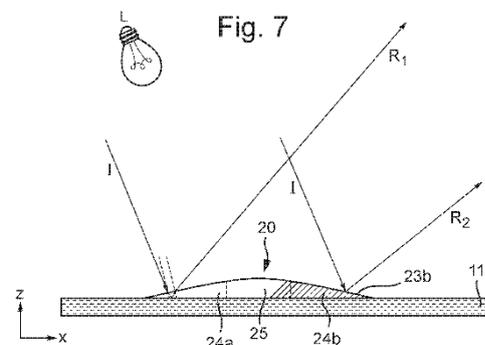
**DE LA RUE INTERNATIONAL**

### SECURITY DEVICE AND METHOD OF MANUFACTURE THEREOF

A security device is disclosed, comprising: a substrate having a reflective surface; and a printed array of elements on a substantially flat area of the substrate. Each element is formed of at least a first material which is at least semi-transparent and a second material, the first and second materials having different optical characteristics from one another. Each element has a raised surface profile relative to the substrate including at least first and second sides sloping from the top of the element to at least first and second respective edges of the element, at which the first and second sides meet a substantially flat base surface of the element parallel to the substrate. The first and second sides have different orientations from one another and each lie at an acute angle to the substrate normal as measured at the respective edge of the element. Each element of the printed array comprises: a first edge portion which defines at least the first edge, part of the first side of the element, and part of the flat base surface of the element, and which is formed substantially only of the first material, such that the optical characteristics of the first material control the appearance of light reflected by the reflective surface through the first edge portion; a second edge portion which defines at least the second edge, part of the second side of the element, and part of the flat base surface of the element, and which is formed substantially only of the second material, such that the optical characteristics of the second material control the appearance of light reflected by the second edge portion or by the reflective surface through the second edge portion; and a middle portion which is located between the first and second edge portions and across which at least the first and second materials are both present. Under illumination by light from a fixed direction away from the substrate normal, when viewed from a first viewing angle the element appears to have substantially the optical characteristics of the first material and at a second viewing angle the element appears to have substantially the optical characteristics of the second material.

### DISPOSITIF DE SÉCURITÉ ET SON PROCÉDÉ DE FABRICATION

Est divulgué un dispositif de sécurité qui comprend : un substrat ayant une surface réfléchissante ; un réseau d'éléments imprimé sur une zone sensiblement plate du substrat. Chaque élément est formé d'au moins un premier matériau, qui est au moins semi-transparent, et d'un second matériau, les premier et second matériaux ayant des caractéristiques optiques différentes les unes des autres. Chaque élément présente un profil de surface surélevé par rapport au substrat comprenant au moins des premier et second côtés inclinés de la partie supérieure de l'élément jusqu'à au moins des premier et second bords respectifs de l'élément, au niveau desquels les premier et second côtés rencontrent une surface de base sensiblement plate de l'élément parallèle au substrat. Les premier et second côtés ont des orientations différentes les unes des autres et se situent chacun à un angle aigu par rapport au substrat normal tel que mesuré au niveau du bord respectif de l'élément. Chaque élément du réseau imprimé comprend : une première partie de bord qui délimite au moins le premier bord, une partie du premier côté de l'élément et une partie de la surface de base plate de l'élément, et qui est formée sensiblement uniquement du premier matériau, de telle sorte que les caractéristiques optiques du premier matériau commandent l'aspect de la lumière réfléchi par la surface réfléchissante à travers la première partie de bord ; une seconde partie de bord qui délimite au moins le second bord, une partie du second côté de l'élément et une partie de la surface de base plate de l'élément, et qui est formée sensiblement uniquement du second matériau, de telle sorte que les caractéristiques optiques du second matériau commandent l'aspect de la lumière réfléchi par la seconde partie de bord ou par la surface réfléchissante à travers la seconde partie de bord ; une partie centrale qui est située entre les première et seconde parties de bord et à travers laquelle au moins les premier et second matériaux sont tous deux présents. Lorsque l'élément est observé à partir d'un premier angle de visualisation, sous l'éclairage d'une lumière provenant d'une direction fixe, à l'opposé de la normale au substrat, ledit élément semble avoir sensiblement les caractéristiques optiques du premier matériau et à un second angle de visualisation, l'élément semble avoir sensiblement les caractéristiques optiques du second matériau.

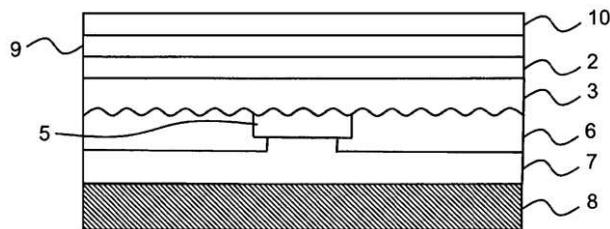


**SECURITY ELEMENT, VALUE DOCUMENT EQUIPPED WITH THE SAME AND PRODUCTION METHOD**

The invention relates to a method for producing a security element (12) suitable for securing a value document (13), comprising a) providing a temporary carrier substrate (1); b) providing the temporary carrier substrate (1) with an embossing lacquer layer (3), into which a relief structure (4) is embossed; c) the application by printing of a functional layer (5) to the embossing lacquer layer (3) in the form of a motif, so that the functional layer (5), on the side facing the embossing lacquer layer (3), which faces the embossing lacquer layer (3), to the relief structure (4); d) applying an opaque layer (6) as a layer adjoining the functional layer (5), wherein the opaque layer (6) masks the functional layer (5), i.e. overlaps the edge region of the functional layer (5); e) applying an adhesive layer (7); f) applying a stationary carrier substrate (8) to the adhesive layer (7); and g) removing the temporary carrier substrate (1) from the embossing lacquer layer (3).

**ÉLÉMENT DE SÉCURITÉ, DOCUMENT DE VALEUR ÉQUIPÉ DE CELUI-CI ET PROCÉDÉ DE FABRICATION**

L'invention concerne un procédé pour fabriquer un élément de sécurité (12) approprié pour sécuriser un document de valeur (13), lequel procédé consiste à a) fournir un substrat de support temporaire (1) ; b) doter le substrat de support temporaire (1) d'une couche de vernis de gaufrage (3) dans laquelle une structure en relief (4) est gaufrée ; c) appliquer, par impression, une couche fonctionnelle (5) sous la forme d'un motif sur la couche de vernis de gaufrage (3) de telle sorte que la couche fonctionnelle (5), sur le côté faisant face à la couche de vernis de gaufrage (3), se conforme à la structure en relief (4) ; d) appliquer une couche opaque (6) en tant que couche adjacente à la couche fonctionnelle (5), la couche opaque (6) masquant la couche fonctionnelle (5), c'est-à-dire recouvrant la région de bord de la couche fonctionnelle (5) ; e) appliquer une couche adhésive (7) ; f) appliquer un substrat de support stationnaire (8) sur la couche adhésive (7) ; et à g) retirer le substrat de support temporaire (1) de la couche de vernis de gaufrage (3).



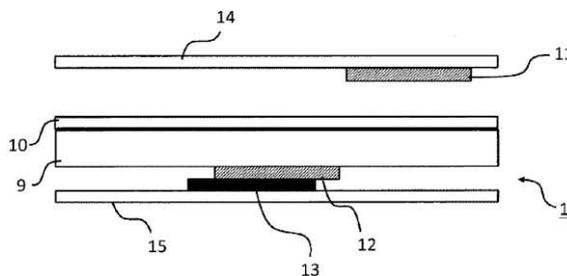
**CLAIM 1.** A method for producing a security element (12) suitable for securing a value document (13), comprising a) providing a temporary carrier substrate (1); b) providing the temporary carrier substrate (1) with an embossing lacquer layer (3), into which a relief structure (4) is embossed; c) the application by printing of a functional layer (5) to the embossing lacquer layer (3) in the form of a motif, so that the functional layer (5), on the side facing the embossing lacquer layer (3), which faces the embossing lacquer layer (3), to the relief structure (4); d) applying an opaque layer (6) as a layer adjoining the functional layer (5), wherein the opaque layer (6) masks the functional layer (5), i.e. overlaps the edge region of the functional layer (5); e) applying an adhesive layer (7); f) applying a stationary carrier substrate (8) to the adhesive layer (7); and g) removing the temporary carrier substrate (1) from the embossing lacquer layer (3).

**LAMINATE, PRINT PRODUCT, AND METHOD USING LAMINATE**

The present invention addresses the problem of providing a laminate, etc., capable of being used as, inter alia, an information medium for which security is improved by adding an information display that is recognizable via an infrared camera or the like while maintaining the black-colored, etc., information display of a laser coloring layer. Provided is a laminate characterized by comprising: a base material layer; a near infrared ray-absorbing layer that is formed on a first surface side of the base material layer and includes a near infrared ray-absorbing ink composition containing a near infrared ray-absorbing material; and a laser coloring layer that is formed on a second surface side of the base material layer, contains a laser coloring agent, and performs coloring by applying laser light, wherein the near-infrared ray absorbing material includes cesium tungsten oxide or lanthanum hexaboride, and applying laser light to a target portion of the near-infrared ray absorbing layer lowers near-infrared ray absorption in at least a prescribed wavelength range in the target portion.

**STRATIFIÉ, PRODUIT D'IMPRESSION ET PROCÉDÉ UTILISANT LE STRATIFIÉ**

La présente invention aborde le problème de la fourniture d'un stratifié, etc., permettant d'être utilisé comme, entre autres, un support d'informations pour lequel la sécurité est améliorée par l'ajout d'un affichage d'informations qui est reconnaissable par l'intermédiaire d'une caméra infrarouge ou similaire tout en maintenant l'affichage d'informations de couleur noire, etc., d'une couche de coloration laser. Est divulgué un stratifié caractérisé en ce qu'il comprend : une couche de matériau de base ; une couche absorbant les rayons infrarouges proches qui est formée sur un premier côté de surface de la couche de matériau de base et comprend une composition d'encre absorbant les rayons infrarouges proches contenant un matériau absorbant les rayons infrarouges proches ; et une couche de coloration laser qui est formée sur un second côté de surface de la couche de matériau de base, contient un agent colorant au laser et réalise une coloration par application d'une lumière laser, le matériau absorbant les rayons infrarouges proches comprenant de l'oxyde de césium-tungstène ou de l'hexaborure de lanthane, et l'application d'une lumière laser à une partie cible de la couche absorbant les rayons infrarouges proches diminue l'absorption des rayons infrarouges proches dans au moins une plage de longueurs d'onde prescrite dans la partie cible.



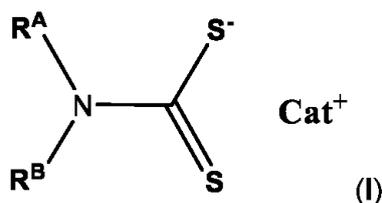
**CLAIM 1.** A laminate comprising: a substrate layer; a near-infrared absorbent layer formed on a first surface side of the substrate layer, the near-infrared absorbent layer comprising a near-infrared absorbent ink composition comprising a near-infrared absorbent material; and a laser color developing layer formed on a second surface side of the substrate layer, the laser color developing layer comprising a laser color developer and developing a color by exposure to laser light, wherein the near-infrared absorbent material comprises: Cesium tungsten oxide or lanthanum hexaboride, and the near infrared radiation absorption in at least a predetermined wavelength range of a target portion of the near infrared radiation absorption layer is reduced by irradiating the target portion with laser light.

**UV-VIS RADIATION CURABLE SECURITY INKS FOR PRODUCING DICHROIC SECURITY FEATURES**

The present invention provides a UV-Vis radiation curable security ink for producing a security feature for securing value documents, wherein said security feature exhibits a blue color upon viewing in transmitted light and a metallic yellow color upon viewing in incident light. The UV-Vis radiation curable security ink comprises a cationically curable or a hybrid curable ink vehicle, and silver nanoplatelets bearing a surface stabilizing agent of general formula (I) wherein the residue RA is a C2-C4alkyl group substituted with a hydroxy group; the residue RB is selected from a C1-C4alkyl group, and a C2-C4alkyl group substituted with a hydroxy group; and Cat+ is an ammonium cation of general formula +NH<sub>2</sub>RCRD, wherein the residue RC is a C2-C4alkyl group substituted with a hydroxy group; and the residue RD is selected from a C1-C4alkyl group, and a C2-C4alkyl group substituted with a hydroxy group.

**ENCRES DE SÉCURITÉ DURCISSABLES PAR RAYONNEMENT UV-VIS POUR LA PRODUCTION D'ÉLÉMENTS DE SÉCURITÉ DICHROÏQUES**

La présente invention concerne une encre de sécurité durcissable par rayonnement UV-Vis pour la production d'un élément de sécurité pour sécuriser un document de valeur, ledit élément de sécurité présentant une couleur bleue lors de l'observation en lumière transmise et une couleur jaune métallique lors de l'observation en lumière incidente. L'encre de sécurité durcissable par rayonnement UV-Vis comprend un véhicule d'encre durcissable par voie cationique ou hybride, et des nanoplaquettes d'argent portant un agent de stabilisation de surface de formule générale (I), le résidu RA étant un groupe alkyle en C2-C4 substitué par un groupe hydroxy; le résidu RB étant sélectionné parmi un groupe alkyle en C1-C4, et un groupe alkyle en C2-C4 substitué par un groupe hydroxy; et Cat+ est un cation d'ammonium de formule générale NH<sub>2</sub>RCRD, le résidu RC étant un groupe alkyle C2-C4 substitué par un groupe hydroxy; et le résidu RD est sélectionné parmi un groupe alkyle en C1-C4, et un groupe alkyle en C2-C4 substitué par un groupe hydroxy.



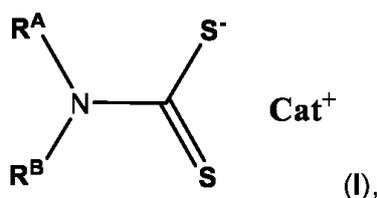
**CLAIM 1.** A UV-Vis radiation curable security ink for producing a security feature exhibiting a blue color upon viewing in transmitted light and a metallic yellow color upon viewing in incident light, wherein said ink comprises: a) from about 7.5 wt-% to about 20 wt-% of silver nanoplatelets having a mean diameter in the range of 50 to 150 nm with a standard deviation of less than 60%, a mean thickness in the range of 5 to 30 nm with a standard deviation of less than 50%, and a mean aspect ratio higher than 2.0, wherein the mean diameter is determined by transmission electron microscopy and the mean thickness is determined by transmission electron microscopy, and wherein the silver nanoplatelets bear a surface stabilizing agent of general formula (I) wherein the residue RA is a C2-C4alkyl group substituted with a hydroxy group; the residue RB is selected from a C1-C4 alkyl group, and a C2-C4alkyl group substituted with a hydroxy group; and Cat+ is an ammonium cation of general formula +NH<sub>2</sub>RCRD, wherein the residue Rc is a C2-C4alkyl group substituted with a hydroxy group; and the residue RD is selected from a Ci-C4alkyl group, and a C2-C4alkyl group substituted with a hydroxy group; b) from about 45 wt-% to about 80 wt-% of either a cycloaliphatic epoxide, or a mixture of a cycloaliphatic epoxide and one or more UV-Vis radiation curable compounds; c) one or more cationic photoinitiators; d) a perfluoropolyether surfactant functionalized with one or more functional groups selected from the group consisting of: hydroxyl, acrylate, methacrylate, and trialkoxysilyl; e) from about 3 wt-% to about 12 wt-% of a polyvinyl chloride copolymer containing at least 60 wt-% of vinyl chloride; and optionally f) up to about 25 wt-% of an organic solvent; the weight percents being based on the total weight of the UV-Vis radiation curable security ink.

**UV-VIS RADIATION CURABLE SECURITY INKS FOR PRODUCING DICHROIC SECURITY FEATURES**

The present invention provides a UV-Vis radiation curable security ink for producing a security feature for securing value documents, wherein said security feature exhibits a blue color upon viewing in transmitted light and a metallic yellow color upon viewing in incident light. The UV-Vis radiation curable security ink comprises a cationically curable or a hybrid curable ink vehicle, and silver nanoplatelets bearing a surface stabilizing agent of general formula (I) wherein the residue RA is a C2-C4alkyl group substituted with a hydroxy group; the residue RB is selected from a C1-C4 alkyl group, and a C2-C4alkyl group substituted with a hydroxy group; and Cat+ is a cation selected from the group consisting of Na+, K+, Cs+ and Rb+.

**ENCRES DE SÉCURITÉ DURCISSABLES PAR RAYONNEMENT UV-VIS POUR LA PRODUCTION D'ÉLÉMENTS DE SÉCURITÉ DICHROÏQUES**

La présente invention concerne une encre de sécurité durcissable par rayonnement UV-Vis pour produire un élément de sécurité pour sécuriser des documents de valeur, ledit élément de sécurité présentant une couleur bleue lors de la visualisation en lumière transmise et une couleur jaune métallique lors de l'observation en lumière incidente. L'encre de sécurité durcissable par rayonnement UV-Vis comprend un véhicule d'encre durcissable par voie cationique ou hybride, et des nanoplaquettes d'argent portant un agent de stabilisation de surface de formule générale (I), le résidu RA étant un groupe alkyle en C2-C4 substitué par un groupe hydroxy; le résidu RB est sélectionné parmi un groupe alkyle en C1-C4, et un groupe alkyle en C2-C4 substitué par un groupe hydroxy; et Cat+ est un cation sélectionné dans le groupe constitué par Na+, K+, Cs+ et Rb+.



**CLAIM 1.** A UV-Vis radiation curable security ink for producing a security feature exhibiting a blue color upon viewing in transmitted light and a metallic yellow color upon viewing in incident light, wherein said ink comprises: a) from about 7.5 wt-% to about 20 wt-% of silver nanoplatelets having a mean diameter in the range of 50 to 150 nm with a standard deviation of less than 60%, a mean thickness in the range of 5 to 30 nm with a standard deviation of less than 50%, and a mean aspect ratio higher than 2.0, wherein the mean diameter is determined by transmission electron microscopy and the mean thickness is determined by transmission electron microscopy, and wherein the silver nanoplatelets bear a surface stabilizing agent of general formula (I) wherein the residue RA is a C2-C4alkyl group substituted with a hydroxy group; the residue RB is selected from a C1-C4 alkyl group, and a C2-C4alkyl group substituted with a hydroxy group; and Cat\* is a cation selected from the group consisting of Na+, K+, Cs+ and Rb+; b) a perfluoropolyether surfactant functionalized with at least a hydroxy group; c) from about 3 wt-% to about 12 wt-% of a polyvinyl chloride copolymer containing at least 69 wt-% of vinyl chloride; d) d1) from about 25 wt-% to about 55 wt-% of a cycloaliphatic epoxide, and from about 1 wt-% to about 10 wt-% of a cationic photoinitiator; or d2) from about 30 wt-% to about 65 wt-% of a mixture of a cycloaliphatic epoxide and a radically curable compound, from about 1 wt-% to about 6 wt-% of a cationic photoinitiator, and from about 1 wt-% to about 6 wt-% of a free radical photoinitiator; and optionally e) a cationically curable compound selected from the group consisting of: e1) a vinyl ether having two vinyloxy residues in an amount lower than 50% of the weight percent (wt-%) of the cycloaliphatic epoxide of d); e2) a vinyl ether having one vinyloxy residue in an amount lower than about 5 wt-%; e3) an epoxide other than a cycloaliphatic epoxide in an amount lower than about 10 wt-%; e4) an oxetane having two oxetanyl residues in an amount lower than about 20 wt-%; e5) an oxetane having one oxetanyl residue in an amount lower than about 3.5 wt-%; and e6) a mixture of e1) and/or e2) and/or e3) and/or e4) and/or e5); the weight percents being based on the total weight of the UV-Vis radiation curable security ink.

P34945

PRINTING – INK – BANKNOTE

WO2022101207

BASF

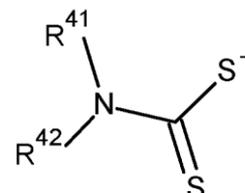
Priority Date: 10/11/2020

COMPOSITIONS, COMPRISING SILVER NANOPATELETS

The present invention relates to compositions, comprising silver nanoplatelets capped by dithiocarbamate anions of formula (XX), Formula (XX). UV-Vis radiation curable inks, containing the silver nanoplatelets, do not degrade and a coating, comprising the composition, shows a blue color in transmission and a metallic yellow color in reflection.

COMPOSITIONS COMPRENANT DES NANOPLAQUETTES D'ARGENT

La présente invention concerne des compositions comprenant des nanoplaquettes d'argent coiffées par des anions dithiocarbamates de formule (XX), formule (XX). Des encres durcissables par rayonnement UV-Vis, contenant les nanoplaquettes d'argent, ne se dégradent pas et un revêtement, comprenant la composition, présente une couleur bleue en transmission et une couleur jaune métallique en réflexion.



**CLAIM 1.** A composition, comprising silver nanoplatelets, wherein the silver nanoplatelets are capped by a dithiocarbamate anion of formula (XX), wherein R41 is a C2-C4alkyl group, which is substituted by one, or two hydroxy groups, and R42 is a C1-C4alkyl group, or a C2-C4alkyl group, which is substituted by one, or two hydroxy groups.

P34946

PRINTING – BANKNOTE

WO2022100883

GIESECKE & DEVRIENT CURRENCY TECHNOLOGY

Priority Date: 10/11/2020

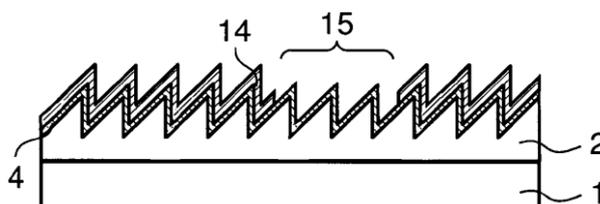
OPTICALLY VARIABLE SECURITY ELEMENT AND METHOD FOR PRODUCING AN OPTICALLY VARIABLE SECURITY ELEMENT

The invention relates to an optically variable security element which has a layer sequence when viewed from an upper side. The layer sequence contains a microstructure (2) which provides a motif visible from the upper side, has a period of 2 μm to 50 μm and is achromatic. Furthermore, the layer sequence has a reflection layer (4) which is arranged on the microstructure (2) and reflects incident light, and a viewing angle-dependent layer (6; 14), wherein the reflection layer (4) or the viewing angle-dependent layer (6; 14) has at least one cutout (15) and the other of the two is unstructured, wherein that layer which has the cutout (15) lies above the other layer which is unstructured, as seen from the top side.

ÉLÉMENT DE SÉCURITÉ À EFFET OPTIQUE VARIABLE ET PROCÉDÉ DE FABRICATION D'UN ÉLÉMENT DE SÉCURITÉ À EFFET OPTIQUE VARIABLE

L'invention concerne un élément de sécurité à effet optique variable présentant une séquence de couches à partir d'une face supérieure. La séquence de couches contient une microstructure (2) présentant un motif visible par la face supérieure, d'une période de 2 μm à 50 μm et achromatique. La séquence de couches présente également une couche de réflexion (4) qui est disposée sur la microstructure (2) et qui réfléchit la lumière incidente, et une couche (6; 14) fonction de l'angle d'observation (6; 14), la couche de réflexion (4) ou la couche fonction de l'angle d'observation (6; 14) présentant au moins un évidement (15) et respectivement l'autre couche étant non structurée, la couche pourvue de l'évidement (15) étant, vu par la face supérieure, située sur l'autre couche qui est non structurée. A la place d'un évidement et d'une couche de réflexion, l'élément de sécurité peut présenter une couche (6; 14) fonction de l'angle d'observation et non structurée, et une couche de réflexion (16; 18) partiellement transparente et non structurée.

**CLAIM 1.** An optically variable security element comprising - a microstructure (2) providing a motif visible from the upper side, - a reflection layer (4) arranged above the microstructure (2), which reflects incident light, and a viewing angle-dependent layer (6; 14), characterized in that - the microstructure (2) has a period of 2 m to 50 m and is achromatic and - the reflection layer (4) or the viewing angle-dependent layer (6; 14) has at least one cutout (15) and the other of the two is unstructured, wherein that layer which has the cutout (15) lies above the other layer which is unstructured, as seen from the top side.



**OPTICALLY VARIABLE SECURITY ELEMENT HAVING A REFLECTIVE/TRANSMISSIVE FEATURE REGION**

The invention relates to an optically variable security element (20) for protecting items of value, the surface area of which element defines a z axis perpendicular thereto, said element comprising a partially reflective and partially transmissive feature region (24). The feature region (24) contains a first sub-region (52) having a first reflection-enhancing coating (36), which first sub-region forms a first reflection motif (80) that is visible in reflection, and said feature region also contains a second sub-region (54) having a second reflection-enhancing coating (46), which second sub-region forms a second reflection motif (82) that is visible in reflection. The first and second sub-regions (50, 52) reflect incident light differently, the first and second reflection motifs (80, 82) having different visibility depending on a viewing direction (62, 64). The feature region (24) also contains a transmission region (56) in which the first and/or second reflection-enhancing coating (36, 46) is omitted and which forms a transmission motif (84) that is visible in transmission, multi-coloured, and appears with two or more chromatic colours in transmission.

**ÉLÉMENT DE SÉCURITÉ OPTIQUEMENT VARIABLE AYANT UNE RÉGION CARACTÉRISTIQUE RÉFLÉCHISSANTE/TRANSMISSIVE**

L'invention concerne un élément de sécurité optiquement variable (20) pour protéger des articles de valeur, la surface de l'élément définissant un axe z perpendiculaire à celui-ci, ledit élément comprenant une région caractéristique (24) partiellement réfléchissante et partiellement transmissive. La région caractéristique (24) contient une première sous-région (52) ayant un premier revêtement améliorant la réflexion (36), ladite première sous-région formant un premier motif de réflexion (80) qui est visible en réflexion, et ladite région caractéristique contient également une seconde sous-région (54) ayant un second revêtement améliorant la réflexion (46), ladite seconde sous-région formant un second motif de réflexion (82) qui est visible en réflexion. Les première et seconde sous-régions (50, 52) réfléchissent différemment la lumière incidente, les premier et second motifs de réflexion (80, 82) ayant une visibilité différente en fonction d'une direction de visualisation (62, 64). La région caractéristique (24) contient en outre une région de transmission (56) dans laquelle le premier et/ou le second revêtement améliorant la réflexion (36, 46) sont omis et qui forme un motif de transmission (84) qui est visible en transmission, multicolore, et apparaît avec au moins deux couleurs chromatiques en transmission.

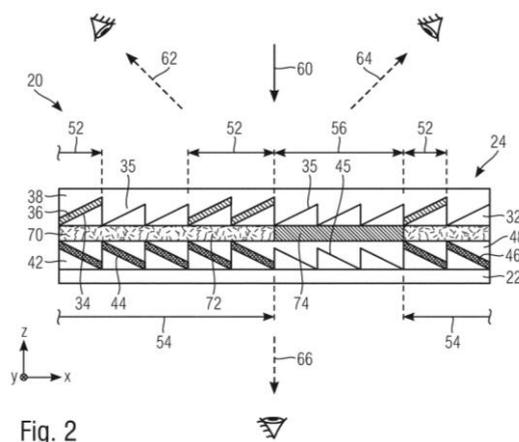


Fig. 2

**CLAIM 1.** An optically variable security element (20) for securing valuable objects, the areal extent of which defines a z-axis perpendicular thereto, having a partially reflective and partially transmissive feature region (24), wherein - the feature region (24) contains a first partial region (52) with a first reflection-increasing coating (36), which forms a first reflection motif (80) visible in reflection, and a second partial region (54) with a second reflection-increasing coating (46), which forms a second reflection motif (82) visible in reflection, - the first and second partial regions (50, 52) reflect incident light differently, wherein the first and second reflection motifs (80, 82) are visible differently depending on a viewing direction (62, 64), and - the feature region (24) contains a transmission region (56), in which the first and/or second reflection-increasing coating (36, 46) is recessed and which forms a transmission motif (84) visible in transmission, which is multicolored and appears in transmission with two or more color colors.

**OPTICAL ANTI-COUNTERFEITING ELEMENT AND MANUFACTURING METHOD THEREFOR, AND ANTI-COUNTERFEITING PRODUCT**

An optical anti-counterfeiting element and a manufacturing method therefor, and an anti-counterfeiting product. The optical anti-counterfeiting element comprises a microlens array layer (2) and a micrographic-text array layer (3). The micrographic-text array layer (3) comprises micrographic-text areas (A) and micrographic-text background areas (B); surface undulation shapes of the micrographic-text areas (A) and the micrographic-text background areas (B) are different; and/or height differences are set between the micrographic-text areas (A) and the micrographic-text background areas (B), so that under sampling synthesis, in the microlens array layer (2) and the micrographic-text array layer (3), the imaged graphic-text areas and/or graphic-text background areas have different visual characteristics. In particular, graphic-text and/or a graphic-text background changes from one color to another color as the viewing angle changes, thereby improving the anti-counterfeiting capability.

**ÉLÉMENT ANTI-CONTREFAÇON OPTIQUE ET SON PROCÉDÉ DE FABRICATION, ET PRODUIT ANTI-CONTREFAÇON**

La présente invention concerne un élément anti-contrefaçon optique et son procédé de fabrication, et un produit anti-contrefaçon. L'élément anti-contrefaçon optique comprend une couche de réseau de microlentilles (2) et une couche de réseau de texte micrographique (3). La couche de réseau de texte micrographique (3) comprend des zones de texte micrographique (A) et des zones d'arrière-plan de texte micrographique (B) ; les formes d'ondulation de surface des zones de texte micrographique (A) et des zones d'arrière-plan de texte micrographique (B) sont différentes ; et/ou des différences de hauteur sont établies entre les zones de texte micrographique (A) et les zones d'arrière-plan de texte micrographique (B), de telle sorte que, dans la synthèse d'échantillonnage, dans la couche de réseau de microlentilles (2) et la couche de réseau de texte micrographique (3), les zones de texte graphique imagées et/ou les zones d'arrière-plan de texte graphique présentent des caractéristiques visuelles différentes. En particulier, un texte graphique et/ou un arrière-plan de texte graphique changent d'une couleur à une autre couleur à mesure que l'angle de visualisation change, ce qui améliore ainsi la capacité d'anti-contrefaçon.

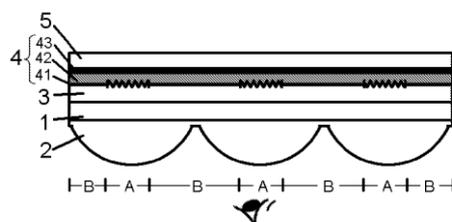


图 3

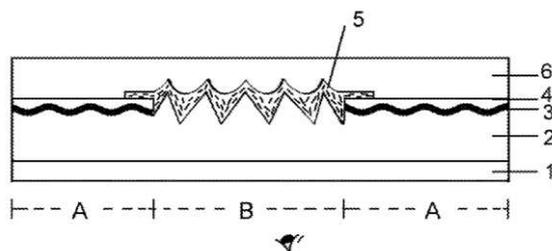
**CLAIM 1.** An optical security element comprising: a substrate; A microlens array layer (2) having a microlens array; Micrographic array layer (3); Wherein said microteletext array layer (3) comprises a microteletext region and a microteletext background region; The shape of surface undulations of the micrographic region and the micrographic background region and the height of the micrographic region and the micrographic background region are different; or The shape of surface undulations of the micrographic region and the micrographic background region is different; or The height of the micrographic region and the micrographic background region are different; Thus viewed from the side of the microlens array layer (2), the microlens array is capable of sample synthesis of the microteletext array layer (3) to form a teletext region and a teletext background region exhibiting different visual characteristics.

### OPTICAL ANTI-COUNTERFEITING ELEMENT, MANUFACTURING METHOD THEREFOR, AND ANTI-COUNTERFEITING PRODUCT

Provided are an optical anti-counterfeiting element, a manufacturing method therefor, and an anti-counterfeiting product. The optical anti-counterfeiting element comprises a relief structure layer (2) comprising a first surface and a second surface opposite to each other, the second surface comprising a first area A and a second area B, the first area A having a first microstructure, the second area B having a second microstructure, and the first microstructure being different from the second microstructure; a first reflective layer (3) located in the first area A; and a second reflective layer (5) located at least in the second area B, when viewed from the side of the first surface, the first area A and the second area B having visual features respectively presented by the first reflective layer (3) and the second reflective layer (5). The present optical anti-counterfeiting element is partitioned by the relief structure layer, and different reflective layers are correspondingly provided in respective areas, such that when a user observes from the other side of the relief structure layer, different areas present visual features of corresponding reflective layers, thereby improving anti-counterfeiting capability.

### ÉLÉMENT ANTI-CONTREFAÇON OPTIQUE, PROCÉDÉ DE FABRICATION DE CELUI-CI, ET PRODUIT ANTI-CONTREFAÇON

L'invention concerne un élément anti-contrefaçon optique, un procédé de fabrication de celui-ci, et un produit anti-contrefaçon. L'élément anti-contrefaçon optique comprend une couche de structure en relief (2) comprenant une première surface et une deuxième surface opposées l'une à l'autre, la deuxième surface comprenant une première zone A et une deuxième zone B, la première zone A ayant une première microstructure, la deuxième zone B ayant une deuxième microstructure, et la première microstructure étant différente de la deuxième microstructure ; une première couche réfléchissante (3) située dans la première zone A ; et une deuxième couche réfléchissante (5) située au moins dans la deuxième zone B, lorsqu'elle est vue depuis le côté de la première surface, la première zone A et la deuxième zone B ayant des caractéristiques visuelles respectivement présentées par la première couche réfléchissante (3) et la deuxième couche réfléchissante (5). L'élément anti-contrefaçon optique selon la présente invention est divisé par la couche de structure en relief, et différentes couches réfléchissantes sont disposées de manière correspondante dans des zones respectives, de sorte que lorsqu'un utilisateur observe depuis l'autre côté de la couche de structure en relief, différentes zones présentent les caractéristiques visuelles des couches réfléchissantes correspondantes, ce qui permet d'améliorer la capacité anti-contrefaçon.



**CLAIM 1.** An optical security element comprising: a substrate; An undulating structural layer (2) comprising an opposing first surface and a second surface, said second surface comprising a first region and a second region, said first region having a first microstructure and said second region having a second microstructure, wherein said first microstructure is different from said second microstructure, and wherein said second region has a second microstructure. A first reflective layer (3) on said first region; A second reflective layer (5) on at least said second region; Wherein said first region and said second region have visual characteristics exhibited by said first reflective layer (3) and said second reflective layer (5), respectively, when viewed from the side of said first surface.

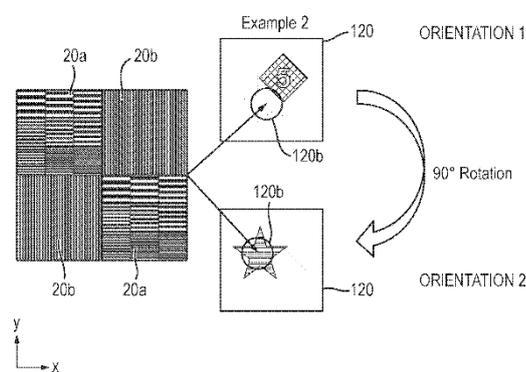
## OPTICAL DEVICES AND METHODS OF MANUFACTURE THEREOF

An optical device that exhibits a variable optical effect upon illumination is disclosed. The optical device comprises: a set of first grating regions (20a), wherein each first grating region comprises a plurality of first grating elements (30), each first grating element having a principal component of orientation within the plane of the device that is substantially orthogonal to a first direction; a set of second grating regions (20b), wherein each second grating region comprises a plurality of second grating elements (30), each second grating element having a principal component of orientation within the plane of the device that is substantially orthogonal to a second direction different to the first direction; wherein at least a subset of the first grating regions each exhibit a diffractive colour such that a user viewing the device at a viewing angle within a first viewing plane that intersects the optical device along the first direction perceives a first diffractive colour image; and at least a subset of the second grating regions are achromatic grating regions (22), wherein each achromatic grating region comprises a plurality of grating sub-regions having different respective grating element pitches ranging from a coarse pitch to a fine pitch and arranged such that, for a plurality of viewing angles within a second viewing plane that intersects the optical device along the second direction, the diffractive colours exhibited by the plurality of grating sub-regions cooperate such that the achromatic grating region is perceived to exhibit diffractive whiteness; and further wherein the set of first grating regions is interlaced with the set of second grating regions. Methods of manufacture of such devices are also provided.

## DISPOSITIFS OPTIQUES ET LEURS PROCÉDÉS DE FABRICATION

L'invention divulgue un dispositif optique qui présente un effet optique variable lors de l'éclairage. Le dispositif optique comprend : un ensemble de premières régions de réseau, chaque première région de réseau comprenant une pluralité de premiers éléments de réseau, chaque premier élément de réseau ayant un composant principal d'orientation dans le plan du dispositif qui est sensiblement orthogonal à une première direction; un ensemble de secondes régions de réseau, chaque seconde région de réseau comprenant une pluralité de seconds éléments de réseau, chaque second élément de réseau ayant un composant principal d'orientation dans le plan du dispositif qui est sensiblement orthogonal à une seconde direction différente de la première direction; au moins un sous-ensemble des premières régions de réseau présentant chacune une couleur de diffraction de telle sorte qu'un utilisateur visualisant le dispositif à un angle de visualisation à l'intérieur d'un premier plan de visualisation qui coupe le dispositif optique le long de la première direction, perçoive une première image de couleur de diffraction; et au moins un sous-ensemble des secondes régions de réseau étant des régions de réseau achromatiques, chaque région de réseau achromatique comprenant une pluralité de sous-régions de réseau présentant des pas d'élément de réseau respectifs différents allant d'un pas grossier à un pas fin et agencées de telle sorte que, pour une pluralité d'angles de visualisation dans un second plan de visualisation qui coupe le dispositif optique le long de la seconde direction, les couleurs de diffraction présentées par la pluralité de sous-régions de réseau de diffraction coopèrent de telle sorte que la région de réseau achromatique soit perçue pour présenter une blancheur de diffraction; et, en outre, l'ensemble de premières régions de réseau étant entrelacé avec l'ensemble de secondes régions de réseau. L'invention concerne également des procédés de fabrication de tels dispositifs.

**CLAIM 1.** An optical device that exhibits a variable optical effect upon illumination, comprising: a set of first grating regions, wherein each first grating region comprises a plurality of first grating elements, each first grating element having a principal component of orientation within the plane of the device that is substantially orthogonal to a first direction; a set of second grating regions, wherein each second grating region comprises a plurality of second grating elements, each second grating element having a principal component of orientation within the plane of the device that is substantially orthogonal to a second direction different to the first direction; wherein at least a subset of the first grating regions each exhibit a diffractive colour such that a user viewing the device at a viewing angle within a first viewing plane that intersects the optical device along the first direction perceives a first diffractive colour image; and at least a subset of the second grating regions are achromatic grating regions, wherein each achromatic grating region comprises a plurality of grating sub-regions having different respective grating element pitches ranging from a coarse pitch to a fine pitch and arranged such that, for a plurality of viewing angles within a second viewing plane that intersects the optical device along the second direction, the diffractive colours exhibited by the plurality of grating sub-regions cooperate such that the achromatic grating region is perceived to exhibit diffractive whiteness; and further wherein the set of first grating regions is interlaced with the set of second grating regions.

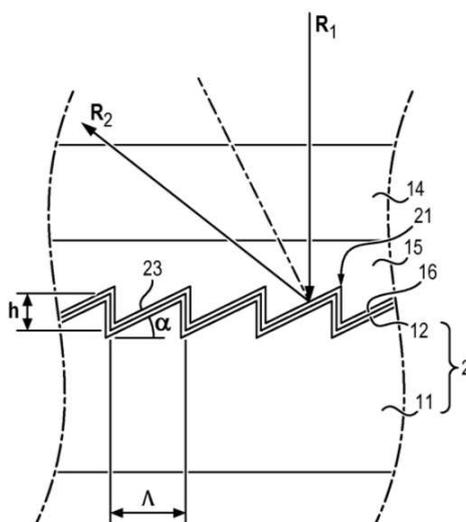


**METHOD FOR PRODUCING A SECURITY DOCUMENT**

The invention relates to a method for producing a security document, which comprises the steps of: • a - forming microstructures (21) in a substrate by pressing a die having microreliefs against a surface of the substrate, the microstructures having alternating projections and depressions, • b - coating the microstructures (21) with an index step layer (16) so that the microstructures can reflect incident light radiation, the index step layer having a thickness that is less than a depth of the microreliefs, and • c - covering the surface of the substrate, including the microstructures (21) and the index step layer, with a protective film (3) of polymer material, the protective film (3) comprising a layer of polymer material and a layer of adhesive, so that the layer of adhesive at least partially fills the depressions and matches the shape of the projections of the microstructures (21) coated with the index step layer, wherein the index step layer has a refractive index different from a refractive index of the protective film (3) of polymer material.

**PROCEDE DE FABRICATION D'UN DOCUMENT DE SECURITE**

• a - former des microstructures (21) dans un substrat par pressage d'une matrice présentant des microreliefs contre une surface du substrat, les microstructures présentant en alternance des saillies et des creux, • b - revêtir les microstructures (21) d'une couche à saut d'indice (16) afin que les microstructures puissent renvoyer un rayonnement lumineux incident, la couche à saut d'indice présentant une épaisseur inférieure à une profondeur des micro reliefs, et • c - recouvrir la surface du substrat, y compris les microstructures (21) et la couche à saut d'indice, par un film de protection (3) en matériau polymère, le film de protection (3) comprenant une couche en matériau polymère et une couche d'adhésif, de sorte que la couche d'adhésif remplit au moins partiellement les creux et épouse les saillies des microstructures (21) revêtues de la couche à saut d'indice, dans lequel la couche à saut d'indice présente un indice de réfraction différent d'un indice de réfraction du film de protection (3) en matériau polymère.



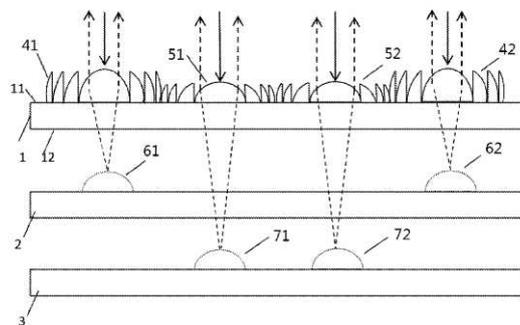
**CLAIM 1.** Method for manufacturing a security document (1), comprising steps of: a - forming microstructures (21) in a substrate (2) by pressing a die (33) having microreliefs against a surface of the substrate (2), the microstructures having alternating protrusions and depressions, b - coating the microstructures (21) with a step-index layer (16) so that the microstructures can reflect incident light radiation, the step-index layer (16) having a thickness less than a depth (h) of the microreliefs, and c - covering the surface of the substrate (2), including the microstructures (21) and the step index layer, with a protective film (3) of polymeric material, the protective film (3) comprising a layer of polymeric material (14) and a layer of adhesive (15), such that the adhesive layer (15) at least partially fills the recesses and conforms to the protrusions of the microstructures (21) coated with the step-index layer (16), wherein the step-index layer (16) has a refractive index different from a refractive index of the protective film (3) made of polymer material.

### OPTICAL ANTI-COUNTERFEITING ELEMENT AND ANTI-COUNTERFEITING PRODUCT COMPRISING OPTICAL ANTI-COUNTERFEITING ELEMENT

An optical anti-counterfeiting element and an anti-counterfeiting product comprising an optical anti-counterfeiting element, the optical anti-counterfeiting element comprising: a substrate (1); a first light gathering element array, which is formed in a first region of a first surface (11) of the substrate (1), the first light element gathering array comprising one or more light gathering elements having a first focal length; and a second light gathering element array, which is formed in a second region of the first surface (11) of the substrate (1), the second light gathering element array comprising one or more light gathering elements having a second focal length that is different from the first focal length. The optical anti-counterfeiting element employs a plurality of light gathering element arrays to implement imaging on receiving screens (2, 3) of different focal lengths, thereby achieving the reproduction of hidden images.

### ÉLÉMENT OPTIQUE ANTI-CONTREFAÇON ET PRODUIT ANTI-CONTREFAÇON COMPRENANT L'ÉLÉMENT OPTIQUE ANTI-CONTREFAÇON

La présente invention concerne un élément optique anti-contrefaçon et un produit anti-contrefaçon comprenant un élément optique anti-contrefaçon, l'élément optique anti-contrefaçon comprenant : un substrat (1) ; un premier réseau d'éléments de collecte de lumière, qui est formé dans une première région d'une première surface (11) du substrat (1), le premier réseau d'éléments de collecte de lumière comprenant un ou plusieurs éléments de collecte de lumière ayant une première distance focale ; et un deuxième réseau d'éléments de collecte de lumière, qui est formé dans une deuxième région de la première surface (11) du substrat (1), le deuxième réseau d'éléments de collecte de lumière comprenant un ou plusieurs éléments de collecte de lumière ayant une deuxième distance focale qui est différente de la première distance focale. L'élément optique anti-contrefaçon utilise une pluralité de réseaux d'éléments de collecte de lumière pour mettre en œuvre une imagerie sur des écrans de réception (2, 3) de différentes distances focales, ce qui permet d'obtenir la reproduction d'images cachées.



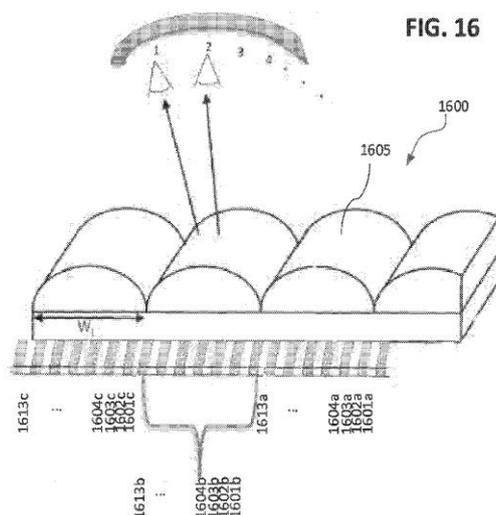
**CLAIM 1.** An optical security element, the optical security element comprising: a substrate; Substrate (1); A first array of light concentrating elements formed in a first region of a first surface (11) of said substrate (1), the first array of light concentrating elements comprising one or more light concentrating elements having a first focal length; A second array of condensing elements formed in a second region of a first surface (11) of said substrate (1), the second array of condensing elements comprising one or more condensing elements having a second focal length different from said first focal length.

**OPTICAL SWITCH DEVICES**

An optical device includes an array of lenses and a plurality of segments disposed under the array of lenses. The plurality of segments corresponds to a plurality of images. Upon tilting the device at different viewing angle, the array of lenses presents images sequentially. In some examples, individual ones of the segments can comprise specular reflecting, transparent, diffusely reflecting, and/or diffusely transmissive features. In some examples, individual ones of the segments can comprise transparent and non-transparent regions. The images can produce one or more optical effects.

**DISPOSITIFS COMMULATEURS OPTIQUES**

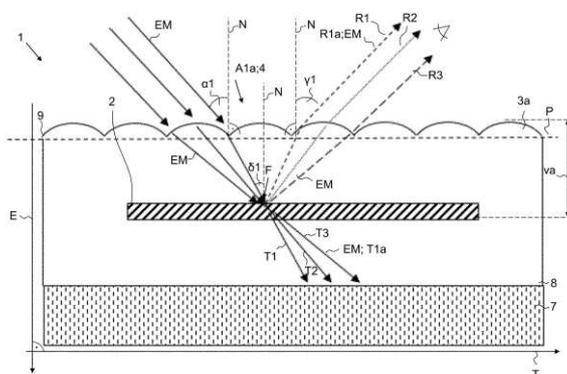
La présente invention concerne un dispositif optique comprenant un réseau de lentilles et une pluralité de segments disposés sous le réseau de lentilles. La pluralité de segments correspond à une pluralité d'images. Lors de l'inclinaison du dispositif selon un angle de visualisation différent, le réseau de lentilles présente les images séquentiellement. Selon certains exemples, des segments individuels peuvent comprendre des caractéristiques de réflexion spéculaire, des caractéristiques transparentes, des caractéristiques de réflexion diffuse et/ou de transmission diffuse. Selon certains autres exemples, des segments individuels peuvent comprendre des régions transparentes et des régions non transparentes. Les images peuvent produire un ou plusieurs effets optiques.



**CLAIM 1.** An optical device comprising: an array of lenses; and a plurality of segments disposed under the array of lenses, the plurality of segments corresponding to a plurality of images, the images comprising at least one icon and at least one background, wherein the plurality of segments comprises smooth features and diffusing features, the smooth features defining one of the at least one icon and the at least one background, the diffusing features defining the at least one background when the smooth features define the at least one icon, and the diffusing features defining the at least one icon when the smooth features define the at least one background, wherein the plurality of segments comprises sets of segments corresponding to images of the plurality of images such that as the device is tilted, the array of lenses presents the images sequentially as the device is tilted through different viewing angles, and wherein the images comprise a first group of images presenting a first icon followed by a second group of images presenting a second icon as the device is tilted, the second icon different from the first icon, at least one of the first or second groups of images presenting an optical effect as the device is tilted.

**PERSONALIZABLE COLOR-SHIFTING DATA CARRIER**

A data carrier having at least one optically variable element, at least one surface element, and at least one security element comprising at least part of the at least one optically variable element and at least part of the at least one surface element. The at least one surface element is configured to guide impinging electromagnetic radiation towards the at least one optically variable element. The data carrier is configured such, that electromagnetic radiation is impinging on the at least one surface element under at least a first arrival angle when the data carrier is seen under a first observation angle, and such, that electromagnetic radiation is impinging on the at least one surface element under at least a second arrival angle being different from the first arrival angle when the data carrier is seen under a second observation angle being different from the first observation angle. The at least one optically variable element is configured to reflect at least a first reflection spectrum upon impingement of the electromagnetic radiation being impinging on the at least one surface element under the first arrival angle, whereby the at least one security element appears according to at least a first appearance, and is further configured to reflect at least a second reflection spectrum upon impingement of the electromagnetic radiation being impinging on the at least one surface element under the second arrival angle, whereby the at least one security element appears according to at least a second appearance being different from the first appearance.



**CLAIM 1.** A data carrier comprising: at least one optically variable element; at least one surface element; and at least one security element comprising at least part of the at least one optically variable element and at least part of the at least one surface element, wherein the at least one optically variable element is arranged after the at least one surface element when seen along an extension direction, wherein the at least one surface element is configured to guide impinging electromagnetic radiation towards the at least one optically variable element, wherein the data carrier is configured such, that electromagnetic radiation is impinging on the at least one surface element under at least a first arrival angle when the data carrier is seen under a first observation angle, wherein the data carrier is further configured such, that electromagnetic radiation is impinging on the at least one surface element under at least a second arrival angle being different from the first arrival angle when the data carrier is seen under a second observation angle being different from the first observation angle, wherein the at least one optically variable element is configured to reflect at least a first reflection spectrum upon impingement of the electromagnetic radiation being impinging on the at least one surface element under the first arrival angle, whereby the at least one security element appears according to at least a first appearance, and wherein the at least one optically variable element is further configured to reflect at least a second reflection spectrum upon impingement of the electromagnetic radiation being impinging on the at least one surface element under the second arrival angle, whereby the at least one security element appears according to at least a second appearance being different from the first appearance.

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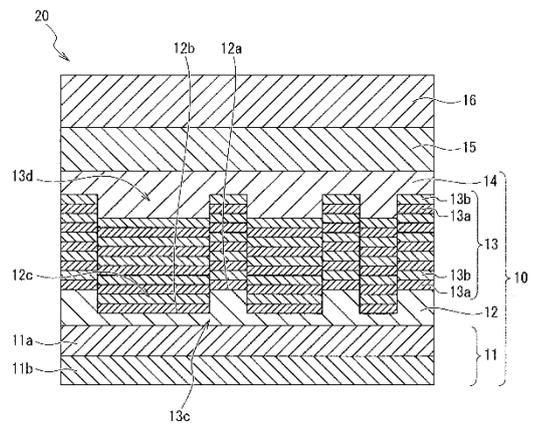
TOPPAN PRINTING

Priority Date: 06/11/2020

**COLORING SHEET, COLORING ARTICLE, TRANSFER FOIL, AND METHOD OF PRODUCING TRANSFER FOIL**

TOPIC: To provide a coloring sheet capable of suppressing damage to a multilayer film layer due to pulling. INVENTION: a support body 11 and a multilayer film layer 13 formed on the support body 11. The multilayer film layer 13 has a configuration in which the refractive indices of the mutually adjacent layers 13 a, 13 b in the multilayer film layer 13 are different from each other, and the reflectance of light in a specific wavelength region of light incident on the multilayer film layer 13 is higher than the reflectance of light in other wavelength regions. In addition, the support body 11 is configured to include at least the pressure-resistant layer 11 a and the cushion layer 11 b, which are two layers having mutually different hardnesses.

**CLAIM 1.** A substrate member and a multilayer film layer formed on the substrate member, wherein refractive indices of mutually adjacent layers of the multilayer film layer differ from each other, Reflectance of light in a specific wavelength region of light incident on the multilayer film layer is higher than reflectance of light in other wavelength regions, a surface of the multilayer film layer on the supporting body side has a first recessing and protruding structure including a plurality of recesses, and when viewed from a direction along a thickness direction of the multilayer film layer, The ball for a ball game according to claim 1, wherein the pattern of the concavities includes a pattern formed from a collection of a plurality of graphic elements having a length along a first direction that is less than or equal to a sub-wavelength, and a length along a second direction orthogonal to the first direction that is greater than or equal to the length along the first direction, and In the plurality of graphic elements, a standard deviation of lengths along the second direction is greater than a standard deviation of lengths along the first direction, and the supporter includes at least two layers having mutually different hardnesses.



P34997

LABEL – RELIEF

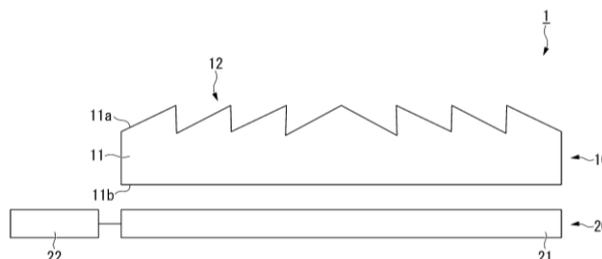
JP2022065356

TOPPAN PRINTING

Priority Date: 15/10/2020

**DISPLAY BODY AND METHOD FOR DETERMINING AUTHENTICITY OF DISPLAY BODY**

TOPIC: To provide a display having a high degree of design. INVENTION: a display body 1 includes a relief portion 10 in which a relief structure 12 having minute recesses and protrusions is formed on one surface of a base material 11 that transmits light, and a light source portion 20 disposed facing the relief portion, the light source portion 20 including a light emitting portion 21 that emits diffused light, and a power source 22 connected to the light emitting portion. The pitch of the minute recesses and protrusions is not less than 1 μm and not greater than 300 μm.



**CLAIM 1.** A display body, comprising: a relief portion including a relief structure including micro recesses and protrusions formed on one surface of a base material through which light is transmitted; and a light source portion disposed facing the relief portion, the light source portion including a light emitting portion configured to emit diffused light and a power supply portion connected to the light emitting portion, wherein a pitch of the micro recesses and protrusions is from 1 m to 300 m.

P35009

**PRINTING – BANKNOTE – THREAD – RELIEF – WINDOW**

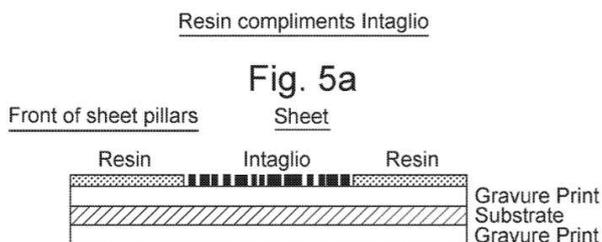
GB2600673

DE LA RUE INTERNATIONAL

Priority Date: 11/09/2020

**SECURITY DOCUMENTS, SECURITY DOCUMENT SHEETS AND METHODS OF MANUFACTURE THEREOF**

A security document comprises a substrate and a security feature incorporated in or applied to the substrate. The security feature locally increases or decreases the thickness of the security document. The security document further comprises at least one raised structure formed of cured material and disposed on one or both sides of the substrate, the raised structure being configured to compensate for the security feature such that the thickness of the security document is substantially uniform across its full area. The raised structure may be provided with additional functionality, preferably an optical or tactile effect. At least one raised structure may have a profile which is substantially the inverse of that provided to the security document by the security feature. There is also provided a security document sheet comprising a substrate on which a plurality the security documents are defined.



**CLAIM 1.** A security document, comprising a substrate and a security feature incorporated in or applied to the substrate, wherein the security feature locally increases or decreases the thickness of the security document, the security document further comprising at least one raised structure formed of cured material and disposed on one or both sides of the substrate, the raised structure being configured to compensate for the security feature such that the thickness of the security document is substantially uniform across its full area.

P35016

**PRINTING – BANKNOTE – THREAD – MAGNETISM**

EP4000942

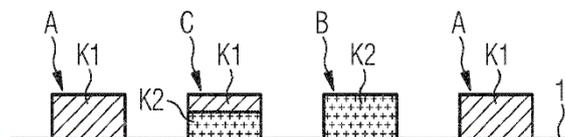
HUECK FOLIEN

Priority Date: 16/11/2020

**SECURITY ELEMENT HAVING MACHINE READABLE SECURITY FEATURES**

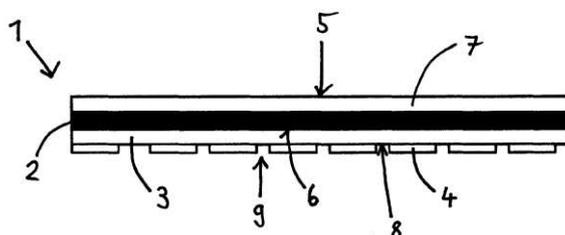
In the case of a security element having machine-readable security features in the form of magnetic materials of different coercive field strength which are present in a plurality of printing inks in a plurality of regions of identical and/or different remanence on a carrier substrate, wherein each region is formed from a printing ink comprising at least one magnetic material selected from magnetic materials having the coercive field strength K1, K2 or K3, at least three different regions are provided which are formed by printing inks which are respectively different from one another, wherein of the printing inks of the at least three regions at least two printing inks in each case only a single one of the magnetic materials, which have the coercive force K1, K2 or K3, and wherein at least one printing ink comprises a mixture of at least two magnetic materials, which have the coercive force K1, K2 or K3. The security element is difficult to reproduce, but allows a simple check of the authenticity.

**CLAIM 1.** A security element having machine-readable security features in the form of magnetic materials of different coercive field strength which are present in a plurality of printing inks in a plurality of regions of identical and/or different remanence on a carrier substrate, wherein each region is formed from a printing ink comprising at least one magnetic material selected from magnetic materials having the coercive field strength K1, K2 or K3, characterized in that at least three different regions are provided which are formed by printing inks which are respectively different from one another, wherein of the printing inks of the at least three regions at least two printing inks in each case only a single one of the magnetic materials, which have the coercive force K1, K2 or K3, and wherein at least one printing ink comprises a mixture of at least two magnetic materials, which have the coercive force K1, K2 or K3. 16, characterized in that the security element in the form of a thread, strip or patch is at least partially embedded in the data carrier or in the value document or applied to the data carrier or the value document.



### SECURITY ELEMENT OF A SECURITY DOCUMENT WITH MOTIF ELEMENT ON MARKING LAYER AND METHOD FOR PRODUCING A SECURITY ELEMENT

The invention relates to a security element (1) of a security document, comprising an effect layer (2), a marking layer (3) and a motif element (4), wherein the effect layer (2) is embodied with a first surface, the marking layer (3) is embodied with a second surface and the motif element (4) is embodied with a third surface, wherein the first area is at least as large as the second area, and the second area is larger than the third area, wherein the motif element (4) is arranged on the marking layer (3), wherein the marking layer (3) is arranged on a rear side (6) of the effect layer (2) and is designed for marking the rear side (6) of the effect layer (2), wherein the marking layer (3) is formed as a control aid for a laterally correct arrangement of the security element (1) on the security document, wherein the motif element (4) is formed as a printing element which is produced by a printing method, wherein the motif element (4) is formed, And to absorb radiation of the infrared spectrum differently from the marking layer (3), or the motif element (4) is transparent in the light spectrum and is designed to absorb radiation of the infrared spectrum differently from the marking layer (3).



**CLAIM 1.** A security element (1) of a security document, comprising an effect layer (2), a marking layer (3) and a motif element (4), wherein the effect layer (2) is formed with a first surface, the marking layer (3) is formed with a second surface and the motif element (4) is formed with a third surface, wherein the first surface is at least as large as the second surface and the second surface is larger than the third surface, wherein the motif element (4) is arranged on the marking layer (3), wherein the marking layer (3) is arranged on a rear side (6) of the effect layer (2) and is designed for marking the rear side (6) of the effect layer (2), wherein the marking layer (3) is formed as a control aid for a laterally correct arrangement of the security element (1) on the security document, wherein the motif element (4) is formed as a printing element which is produced by a printing method, characterized in that In that the motif element (4) is designed to reflect radiation of the light spectrum in the same way as the marking layer (3) and to absorb radiation of the infrared spectrum differently than the marking layer (3), or the motif element (4) is transparent in the light spectrum and is designed to absorb radiation of the infrared spectrum differently from the marking layer (3).

P35018

**PRINTING – CARD – PASSPORT – THERMOCHROMY – RELIEF – MICROLENS**

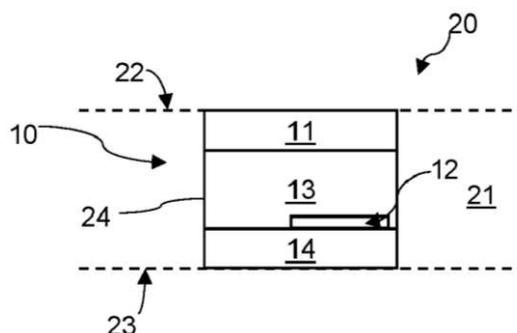
EP4000940

IDEMIA FRANCE

Priority Date: 20/11/2020

**SECURITY DOCUMENT IN WHICH A WINDOW COMPRISES AN OVM PART AND A PHOTOCHROMIC OR THERMOCHROMIC MATERIAL PART**

Security document (20) comprising a body (21), in which a cavity extends in at least a part of a thickness of the body from at least on side (22), and the body comprising a window (10) embedded in the cavity, the window (10) comprising at least an OVM part (11) and a chromic material part (12), at least a portion of the OVM part (11) being superimposed with at least a portion of the chromic material part (12).



**CLAIM 1.** Security document (20) comprising a body (21), the body comprising at least one side (22) and a cavity extending in at least a part of a thickness of the body from the side (22), and the body comprising a window (10) embedded in the cavity, the window (10) comprising at least an OVM part (11) and a chromic material part (12), at least a portion of the OVM part (11) being superimposed with at least a portion of the chromic material part (12).

P35029

**BRAND PROTECTION**

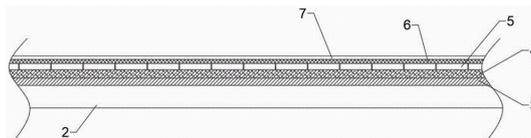
CN216585922U

NANJING JUFA NEW MAT

Priority Date: 31/12/2020

**ALUMINIZED LASER PAPER CONTAINING POLYURETHANE RESIN COATING LAYER**

The utility model discloses aluminized laser paper containing a polyurethane resin coating layer, and belongs to the technical field of aluminized paper manufacturing. An aluminized laser paper containing a polyurethane resin coating layer comprises a paper body, wherein the paper body comprises a raw paper layer, a first isolation layer is sprayed on the top of the raw paper layer, an aluminized layer is sprayed on the top of the first isolation layer, a second isolation layer is arranged on the top of the aluminized layer, a polyurethane resin coating layer is sprayed on the top of the second isolation layer, an anti-scratch layer is sprayed on the top of the polyurethane resin coating layer, and a paper tube is wound in the paper body; the utility model effectively solves the problem of low surface gloss of the aluminized laser paper in the using process, avoids the situation of insufficient prompting effect caused by low intensity of reflected light of the aluminized laser paper, reduces errors in the using process, and simultaneously enables the aluminized laser paper to be conveniently cut through the cutting mechanism provided by the utility model, thereby effectively improving the working efficiency of workers.



**CLAIM 1.** The utility model provides a radium-shine paper of aluminizing that contains polyurethane resin coating layer, includes paper body (1), its characterized in that: paper body (1) includes raw paper layer (2), and raw paper layer (2) top spraying has first isolation layer (3), first isolation layer (3) top spraying has aluminized layer (4), and aluminized layer (4) top is equipped with second isolation layer (5), second isolation layer (5) top spraying has polyurethane resin dope layer (6), and polyurethane resin dope layer (6) top spraying has prevents drawing layer (7).

P35032

PRINTING – LABEL

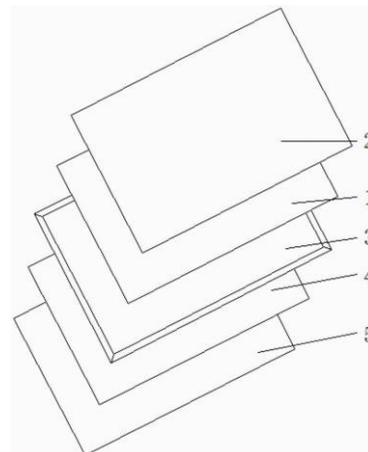
CN216527758U

Priority Date: 27/12/2021

BEIJING XINGHAN SPECIAL PRINTING

ANTI-FAKE CLOTHING DROP

The utility model discloses an anti-counterfeiting clothing tag which comprises an anti-counterfeiting label, wherein a transparent protective layer is bonded on the top of the anti-counterfeiting label, a base layer is bonded on the bottom of the anti-counterfeiting label, a bonding layer is bonded on the bottom of the base layer, an anti-sticking paper layer is bonded on the bottom of the bonding layer, and a chip and a wire harness are respectively arranged on the top of the base layer. According to the anti-counterfeiting clothing tag, the anti-counterfeiting label, the transparent protective layer, the substrate layer, the bonding layer, the anti-sticking paper layer, the wire harness, the chip, the grating identification sheet and the double-layer anti-counterfeiting identification area are matched for use, secondary verification is carried out through the grating identification sheet and the double-layer anti-counterfeiting identification area, and third anti-counterfeiting can be carried out through the chip, so that the anti-counterfeiting label is prevented from being copied or sleeved in a large quantity, the effect of uniqueness is achieved, the safety is improved, and meanwhile, the grating identification sheet and the double-layer anti-counterfeiting identification area are located at the bottom of the anti-counterfeiting label.



**CLAIM 1.** The utility model provides an anti-fake clothing drop, includes antifalsification label (1), its characterized in that: the top of antifalsification label (1) bonds and has transparent inoxidizing coating (2), the bottom of antifalsification label (1) bonds and has base member layer (3), the bottom of base member layer (3) bonds and has adhesive linkage (4), the bottom of adhesive linkage (4) bonds and has antiseized ply (5), the top on base member layer (3) is provided with chip (8) and pencil (7) respectively, the bottom of antifalsification label (1) is provided with grating identification piece (9) and double-deck antifalsification district (10) respectively.

P35046

PRINTING – IRISATION

CN216467016U

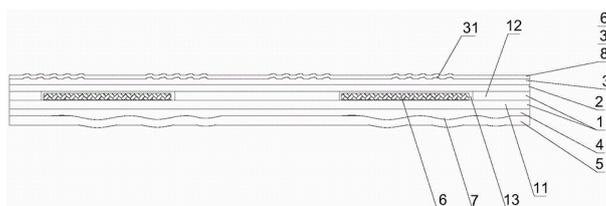
Priority Date: 09/11/2021

ZHEJIANG RONGYIN NEW MATERIAL TECHNOLOGY

COLOR ANTI-COUNTERFEITING BINDING PAPER WITH THREE-DIMENSIONAL EFFECT

The utility model discloses color anti-counterfeiting binding paper with a three-dimensional effect, which comprises a base paper layer, wherein a UV flexible printing ink layer is arranged on one side of the base paper layer, a UV pearlescent layer is arranged on one side, far away from the UV flexible printing ink layer, of the UV flexible printing ink layer, a pearlescent layer three-dimensional pattern formed by stamping a plurality of flexible plates is arranged on the surface of the UV pearlescent layer, a second anti-counterfeiting pattern layer is printed on one side, far away from the UV flexible printing ink layer, of the base paper layer, and a semitransparent writing paper layer is arranged on one side, far away from the base paper layer, of the second anti-counterfeiting pattern layer; the UV pearlescent layer is provided with the pearlescent layer three-dimensional pattern formed by flexible plate imprinting, the three-dimensional effect is obtained by drying after imprinting, the layering sense of the binding paper is improved, the pattern is more three-dimensional, the attractiveness is stronger, and the semitransparent writing paper layer is convenient to write.

**CLAIM 1.** The utility model provides a colored anti-fake binding paper with stereoeffect, includes base paper layer (1), its characterized in that: base paper layer (1) one side is equipped with UV flexography printing ink layer (2), keep away from on UV flexography printing ink layer (2) one side of UV flexography printing ink layer (2) is equipped with UV pearl layer (3), UV pearl layer (3) surface is equipped with pearl layer three-dimensional pattern (31) that a plurality of gentle board imprints formed, keep away from on base paper layer (1) one side printing on UV flexography printing ink layer (2) has second anti-fake pattern layer (4), keep away from on second anti-fake pattern layer (4) one side of base paper layer (1) is equipped with the translucence and writes ply (5).



P35048

## PRINTING – RELIEF – MICROPRISM

CN216466707U

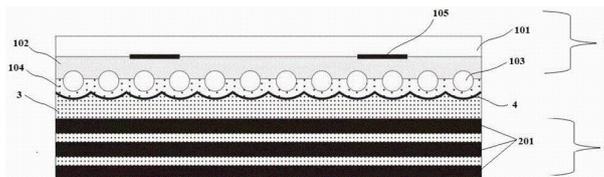
NIPPON CARBIDE KOGYO

Priority Date: 22/12/2021

### RETRO-REFLECTION SHEET WITH SUBSTRATE AND CAPABLE OF BEING PRINTED BY CARBON RIBBON

The utility model provides a retro-reflection sheet with a base material and capable of being printed by a carbon ribbon, which comprises a retro-reflection structure layer, a mirror reflection layer and a base material layer; the mirror reflection layer is connected with a base material layer through an adhesive layer, the base material layer comprises a laminated film of at least two resin films, and the thickness of the base material layer is 188-1000  $\mu\text{m}$ . The utility model provides a but contrary reflective sheet of taking substrate carbon ribbon to print can improve the damage of printing the effect and to printer head.

**CLAIM 1.** The retro-reflective sheet with the base material and capable of being printed by the carbon ribbon is characterized by comprising a retro-reflective structure layer, a mirror reflection layer and a base material layer from top to bottom in sequence; wherein the content of the first and second substances, the specular reflection layer is connected with a base material layer through an adhesive layer, the base material layer comprises a laminated film of at least two resin films, the thickness of the substrate layer is 188 ~ 1000  $\mu\text{m}$ .



P35065

## PRINTING – MAGNETISM

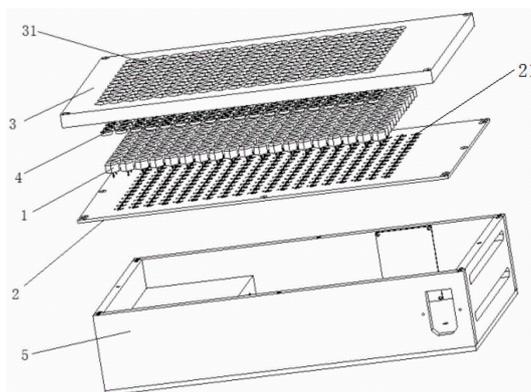
CN114475031

HUIZHOU HUAYANG OPTICAL TECHNOLOGY

Priority Date: 30/12/2021

### 3D BALL EFFECT GENERATION DEVICE AND METHOD

The invention discloses a 3D ball effect generating device which comprises a mounting box, a motor mounting plate arranged in the mounting box, a motor arranged on the motor mounting plate, an upper cover plate matched with the mounting box and an electric control plate used for controlling the motor, wherein the motor mounting plate is arranged on the motor mounting plate; the upper cover plate is provided with a through hole, a magnet is arranged in the through hole, and the magnet is connected with the motor; the electric control board is connected with a power supply. The invention also discloses a method for producing the 3D ball effect by using the device, and the production efficiency can be improved by using the device; the magnet is arranged on the outer shell of the outer rotor instead of the rotating shaft, so that a machined kit required for mounting the rotating shaft is saved, and the kit cost is saved; when the outer rotor model airplane motor is adopted, the rotating speed can be changed by ten thousand, and the ball efficiency or the forming efficiency of the cat eye beads are greatly improved.



**CLAIM 1.** A 3D ball effect generating device is characterized by comprising a mounting box, a motor mounting plate arranged in the mounting box, a motor arranged on the motor mounting plate, an upper cover plate matched with the mounting box and an electric control plate used for controlling the motor; the upper cover plate is provided with a through hole, the motor is connected with the magnet, and the magnet is arranged in the through hole; the electric control board is connected with a power supply.

P35069

## PRINTING – MAGNETISM

CN114454638

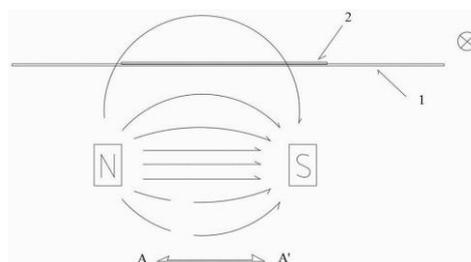
Priority Date: 05/01/2022

CHINA BANKNOTE PRINTING TECHNOLOGY RESEARCH INSTITUTE

### OPTICALLY VARIABLE MAGNETIC INK PRINTED PRODUCT, MANUFACTURING METHOD AND MANUFACTURING EQUIPMENT THEREOF

The application discloses an optically variable magnetic ink printed product, a manufacturing method thereof and manufacturing equipment thereof, wherein the method for manufacturing the optically variable magnetic ink printed product comprises the following steps: after an optically variable magnetic ink layer is formed on a printed material, a first magnet is used for carrying out pre-magnetization treatment on the optically variable magnetic ink layer, a second magnet is used for carrying out magnetization orientation treatment on the optically variable magnetic ink layer after the pre-magnetization treatment, wherein the included angle between the N-S pole connecting line of the first magnet and the N-S pole connecting line of the second magnet is 45-90 degrees. According to the technical scheme, the pre-magnetization process is added before the formal magnetization orientation process, and the included angle between the N-S pole connecting line of the first magnet and the N-S pole connecting line of the second magnet is 45-90 degrees, so that the area with fuzzy bright band edges in the finally obtained bright color light variation pattern can be narrowed, the edges of the bright band are clearer, and the visual effect of the bright color light variation pattern is improved.

**CLAIM 1.** A method of making a photo-changeable magnetic ink print, comprising: after the optically variable magnetic ink layer is formed on the printing stock, the optically variable magnetic ink layer is pre-magnetized by using a first magnet, carrying out magnetization orientation treatment on the pre-magnetized optically variable magnetic ink layer by using a second magnet, wherein, the included angle between the N-S pole connecting line of the first magnet and the N-S pole connecting line of the second magnet is 45-90 degrees.



P35080

## PRINTING

CN114407547

Priority Date: 29/12/2021

JIANGSU TAIJIA NEW MATERIAL TECHNOLOGY

### WASHABLE ANTI-COUNTERFEITING HOT STAMPING FILM AND PREPARATION METHOD THEREOF

The invention discloses a washable anti-counterfeiting hot stamping film which comprises a substrate layer, a release layer, an imaging layer, a metal reflecting layer and an adhesive layer, wherein the substrate layer, the release layer, the imaging layer, the metal reflecting layer and the adhesive layer are sequentially arranged; a wear-resistant protective layer is arranged between the release layer and the imaging layer; the buffer layer is arranged between the wear-resistant protective layer and the imaging layer, the wear-resistant protective layer and the buffer layer are arranged between the imaging layer and the release layer, the wear-resistant protective layer has good wear-resistant, waterproof, weather-resistant and acid-base corrosion-resistant effects, the imaging layer can be protected, the imaging layer can effectively express patterns in a longer time, the buffer layer has good elasticity, the effect of blocking and buffering is achieved, the imaging layer is prevented from deforming and damaging the wear-resistant layer and the release layer in the imaging process, negative effects on the release effect and the wear-resistant effect of the finished anti-counterfeiting hot stamping film are further avoided, and the imaging effect of the finished hot stamping film is favorably improved.

**CLAIM 1.** The utility model provides a resistant washing anti-fake thermoprint membrane, includes the substrate layer that sets gradually, leaves type layer, formation of image layer, metal reflection stratum and adhesive layer, its characterized in that: a wear-resistant protective layer is arranged between the release layer and the imaging layer, and is formed by coating and drying wear-resistant protective paint; a buffer layer is arranged between the wear-resistant protective layer and the imaging layer; the buffer layer is prepared by processing the following raw materials in parts by weight: 20-25 parts of thermoplastic acrylic resin, 6-8 parts of epoxy resin, 16-19 parts of solvent, 2.5-4 parts of nano titanium dioxide and 0.4-0.5 part of silane coupling agent; the preparation process of the buffer layer comprises the following steps: s21, adding the solvent, the thermoplastic acrylic resin and the epoxy resin into the reaction kettle according to the weight ratio, and stirring, mixing and dispersing uniformly to obtain a premix; s22, stirring the premix obtained in the previous step, adding the silane coupling agent, adding the nano titanium dioxide, and continuously stirring until the nano titanium dioxide is uniformly dispersed; s23, uniformly adding a brightener into the product obtained in the previous step within 10-20min, and stirring until the mixture is uniformly mixed after the brightener is completely added to obtain the wear-resistant protective layer paint; and S24, coating the wear-resistant protective layer paint on the surface of the release layer and drying to obtain the buffer layer.

P35081

PRINTING – BRAND PROTECTION

CN114407544

QINGDAO JUSTO PACKAGING

Priority Date: 24/01/2022

#### PREPARATION METHOD OF MULTIDIMENSIONAL REFRACTION THREE-DIMENSIONAL TIPPING PAPER

The invention relates to a preparation method of multi-dimensional refraction three-dimensional tipping paper, which comprises the following steps of S1: 1-1, selecting red five stars as a main body design pattern, highlighting the three-dimensional effect of the five stars hot stamping, and combining stripes with circular dots by using a clip; 1-2, equally dividing each corner of the five-star pattern into two surfaces, wherein one surface of each corner is a laser red surface, and the other surface of each corner is a deep red surface. The invention has the advantages that: the technical problem of cigarette among the prior art is with connecting pattern and the lines of dress paper to be difficult to realize multidimension degree refraction stereoeffect is solved, will fold two kinds of electrochemical aluminium of same look system and press, through radium-shine and two kinds of different luminance of dark color, the third dimension of outstanding pattern and lines, different angle refraction electrochemical aluminium colour reflects a cigarette gorgeous effect.

**CLAIM 1.** A preparation method of multi-dimensional refraction three-dimensional tipping paper is characterized by comprising the following steps S1, file making: 1-1, selecting red five stars as a main body design pattern, highlighting the three-dimensional effect of the five stars hot stamping, and combining stripes with circular dots by using a clip; 1-2, equally dividing each corner of the five-star pattern into two surfaces, wherein one surface of each corner is a hollow surface, and the other surface of each corner is a deep red surface; 1-3, laminating the deep red surface on the laser red surface: the deep red surface is provided with a hollow pattern of the square-wave pattern, and a plurality of lines with the width of 0.1mm and lines with the width of 0.18mm are overlapped and pressed, and the hollow pattern of the square-wave pattern is subjected to gold stamping overprinting; laminating a laser red surface during gold stamping overprinting; a plurality of lines with the width of 0.18mm are arranged on the laser red surface; s2, after the file is manufactured according to the step S1, the tipping paper is manufactured.



P35089

PRINTING – LABEL

CN114378968

SHENZHEN DUOHEYING NEW MATERIAL

Priority Date: 12/01/2022

#### GAS FILM WITH ANTI-COUNTERFEITING EFFECT AND PRODUCTION METHOD THEREOF

The invention discloses a gas film with an anti-counterfeiting effect and a production method thereof. The gas film prepared by the invention has the advantages of simple production process, low anti-counterfeiting cost, easy processing and forming and good application prospect.

**CLAIM 1.** The production method of the air film with the anti-counterfeiting effect is characterized by comprising the following steps: (1) mixing vinyl trimethoxy silane, a surfactant and hydrochloric acid for reaction, adding an aqueous solution of sodium hydroxide to adjust the pH value to be alkaline, continuously reacting for a period of time, neutralizing with hydrochloric acid until the pH value is 7, centrifuging to obtain a precipitate, washing, drying and crushing to obtain vinyl polysiloxane microspheres; (2) adding vinyl polysiloxane microspheres into dilute sulfuric acid for heating reaction, centrifuging to obtain precipitate, washing, drying and crushing to obtain hydroxyl polysiloxane microspheres; (3) adding hydroxyl polysiloxane microspheres and 3-aminopropyltrimethoxysilane into xylene for heating reaction, centrifuging to obtain precipitate, washing and drying to obtain 3-aminopropyltrimethoxysilane grafted polysiloxane microspheres; (4) mixing succinic acid, an acyl chlorination reagent and toluene, heating for reaction, adding the 3-aminopropyltrimethoxysilane grafted polysiloxane microspheres prepared in the step (3), heating for reaction, adding N-phenyl-p-phenylenediamine, heating for reaction, centrifuging after the reaction is finished, taking precipitate, washing and drying to obtain the antioxidant polysiloxane microspheres; (5) mixing ethylene-tetrafluoroethylene copolymer, antioxidant polysiloxane microspheres and photochromic microcapsules, preparing a gas film master batch by using a double-screw extruder, and then putting the gas film master batch into a casting extruder to melt and extrude the gas film master batch into a film to obtain the gas film with the anti-counterfeiting effect.

*Click on the title to return to table of contents*

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

**N8623**

**WO202284619**

Priority Date: 20/10/2020

**BIOASTER | BIOMERIEUX**

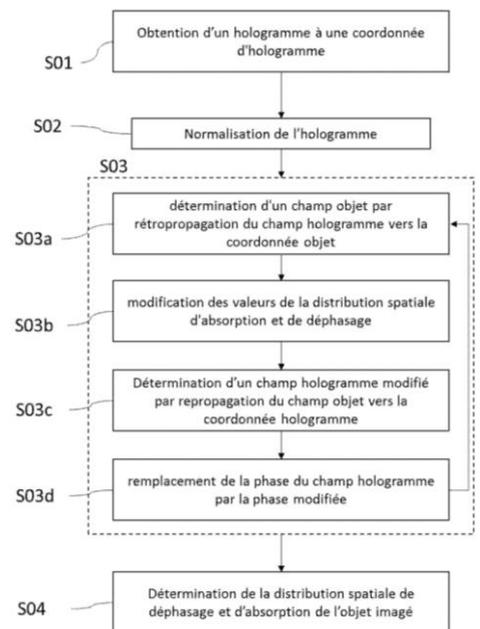
**DIGITAL HOLOGRAPHIC IMAGING TECHNIQUE WITH TWIN IMAGE ELIMINATION**

A digital holographic imaging technique, with iterative steps of: a) through back-propagation to the object coordinate of a hologram field comprising a spatial distribution of amplitude corresponding to the spatial distribution of intensity of the hologram and a spatial distribution of phase, determining (S03a) an object field involving a spatial distribution of absorption and of phase shift of the imaged object, b) thresholding (S03b) the values of the spatial distribution of absorption and of phase shift by decreasing the values to below a respective threshold, the thresholds decreasing in each iteration, c) through repropagation of the object field to the hologram coordinate, determining (S03c) a modified hologram field comprising a modified spatial distribution of amplitude and a modified spatial distribution of phase, d) replacing (S03d) the spatial distribution of phase of the hologram field with the modified spatial distribution of phase, the spatial distribution of phase shift and of absorption of the imaged object being those of the object field of the last iteration.

**PROCÉDÉ D'IMAGERIE HOLOGRAPHIQUE NUMÉRIQUE SUPPRIMANT L'IMAGE JUELLE**

Un procédé d'imagerie holographique numérique, avec des étapes itératives de : a) par rétropropagation vers la coordonnée objet d'un champ hologramme comprenant une distribution spatiale d'amplitude correspondant à la distribution spatiale d'intensité de l'hologramme et une distribution spatiale de phase, détermination (S03a) d'un champ objet impliquant une distribution spatiale d'absorption et de déphasage de l'objet imagé, b) seuillage (S03b) des valeurs de la distribution spatiale d'absorption et de déphasage en diminuant les valeurs inférieures à un seuil respectif, les seuils diminuant à chaque itération, c) par re-propagation du champ objet vers la coordonnée hologramme, détermination (S03c) d'un champ hologramme modifié comprenant une distribution spatiale d'amplitude modifiée et de phase modifiée, d) remplacement (S03d) de la distribution spatiale de phase du champ hologramme par la distribution spatiale de phase modifiée, la distribution spatiale de déphasage et d'absorption de l'objet imagé étant ceux du champ objet de la dernière itération.

**CLAIM 1.** A digital holographic imaging method, comprising the following steps: 1) obtaining (S01) a hologram by holography, said hologram being representative of a spatial intensity distribution, on a hologram plane at a hologram coordinate (zh) of an imaged object (1), interference caused by interactions between an illumination beam and the imaged object placed at an object coordinate (z0) on an imaging axis (6), 2) implementing a plurality of iterations (S03) each comprising the following steps: 2. a) by retropropagation towards the object coordinate of a hologram field comprising a spatial amplitude distribution corresponding to the spatial intensity distribution of the hologram and a spatial phase distribution, determining (S03a) an object field involving an absorption spatial distribution and a phase shift spatial distribution of the imaged object, 2. b) thresholding (S03b) the values of the absorption spatial distribution and of the phase shift spatial distribution of the imaged object by decreasing the values of the absorption spatial distribution below an absorption threshold and by decreasing the values of the phase shift spatial distribution below a phase shift threshold, the absorption threshold and the phase shift threshold decreasing at each iteration, 2. c) by re-propagating the object field towards the hologram coordinate, determining (S03c) a modified hologram field comprising a modified amplitude spatial distribution and a modified phase spatial distribution, 2. d) replacing (S03d) the spatial phase distribution of the hologram field with the modified spatial phase distribution, the spatial amplitude distribution of the hologram field being preserved, 3) determining the spatial phase shift distribution and the spatial absorption distribution of the imaged object as those of the object field of the last iteration.



N8630

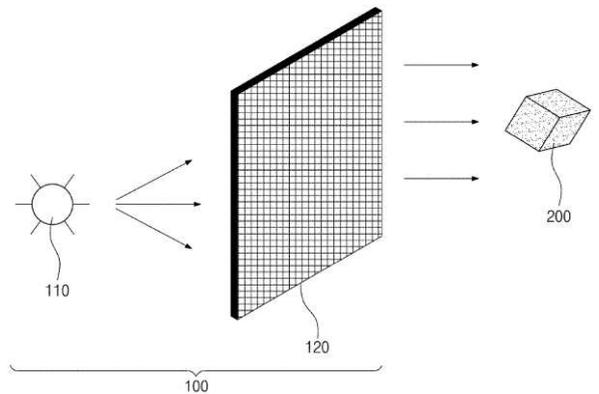
US20220137556  
Priority Date: 02/11/2020

ELECTRONICS & TELECOMMUNICATIONS RESEARCH INSTITUTE

**OPERATION METHOD FOR DIGITAL HOLOGRAM IMPLEMENTATION DEVICE**

Provided is an operation method for a digital hologram implementation device including a backlight and a spatial light modulator, the operation method including setting an initial phase value of an optical signal to a remedy phase, computing a reduced phase based on the remedy phase, correcting the remedy phase based on a difference between the reduced phase and a preset optimized phase, determining whether the corrected remedy phase is a stabilized phase, performing forward propagation on the stabilized phase and an amplitude of the optical signal, correcting the amplitude of the optical signal, performing backward propagation on the corrected amplitude and the stabilized phase, and determining whether a phase derived by the backward propagation is an optimized phase.

**CLAIM 1.** An operation method for a digital hologram implementation device comprising a backlight and a spatial light modulator, the operation method comprising: setting an initial phase value of an optical signal to a remedy phase; computing a reduced phase on a basis of the remedy phase; correcting the remedy phase on a basis of a difference between the reduced phase and a preset optimized phase; determining whether the corrected remedy phase is a stabilized phase; performing forward propagation on the stabilized phase and an amplitude of the optical signal; correcting the amplitude of the optical signal; performing backward propagation on the corrected amplitude and the stabilized phase; and determining whether a phase derived by the backward propagation is an optimized phase.



N8636

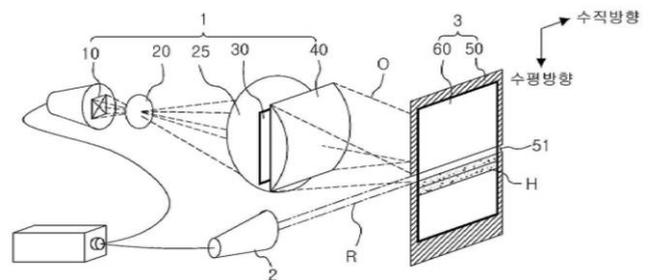
KR20220059880  
Priority Date: 03/11/2020

KYUNGPOOK NATIONAL UNIVERSITY INDUSTRY ACADEMIC COOPERATION FOUNDATION

**HOLOGRAM PRINTER FOR MOVING CYLINDRICAL LENS TO ADJUST HOHEL POSITION**

The present invention relates to a horizontal parallax hologram printer for adjusting a hogel position using a syringe lens. according to the present invention, a hologram pattern is output to irradiate a hologram medium for recording the hologram with object light, an object light forming unit capable of adjusting a focal position and a direction of irradiated object light; a reference light forming unit outputting reference light to cause interference with the object light and irradiating the hologram medium with the reference light; And a hologram recording unit formed on a slit module at a focal position of the object light and having the hologram medium irradiated with the object light and the reference light formed on a rear surface of the slit module, Wherein positions of the cylindrical lens of the object light forming unit and the slit module are adjusted toward the hologram medium in a state in which the hologram medium is fixed, so that a position of a hogel recorded by the object light and the reference light is changed.

**CLAIM 1.** A hologram recording apparatus comprising: an object light forming unit that outputs a hologram pattern to irradiate a hologram medium for recording a hologram with object light, and is capable of adjusting a focal position and a direction of the irradiated object light; a reference light forming unit that outputs reference light to cause interference with the object light, and irradiates the hologram medium with object light; and a slit module that is formed in a slit module at the focal position of the object light, And a hologram recording unit on which the hologram medium irradiated with the object light and the reference light is formed on a rear surface of the slit module, And positions of the cylindrical lens of the object light forming unit and the slit module are adjusted toward the hologram medium in a state where the hologram medium is fixed, so that a position of a hogel recorded by the object light and the reference light is changed.



N8668

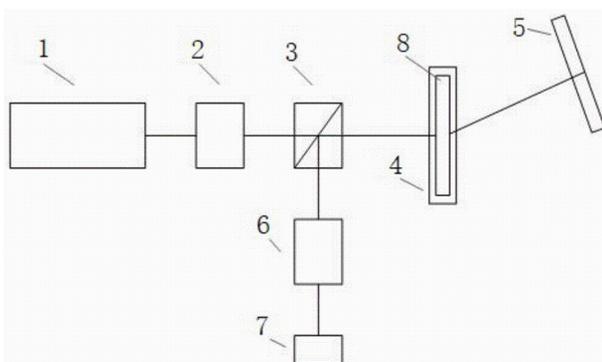
CN114486194

Priority Date: 27/01/2022

CHANGCHUN INSTITUTE OF OPTICS FINE MECHANICS & PHYSICS -  
CHINESE ACADEMY OF SCIENCES

### VOLUME HOLOGRAPHIC GRATING DIFFRACTION WAVEFRONT MEASURING SYSTEM AND MEASURING METHOD THEREOF

The invention provides a volume holographic grating diffraction wavefront measuring system and a measuring method thereof, wherein the measuring system comprises a laser light source used for emitting laser; the beam expanding and collimating lens is arranged in the emergent direction of the laser light source and is used for expanding and collimating the laser into collimated laser; the beam splitter is arranged in the emergent direction of the beam expanding and collimating lens and is used for realizing the transmission and reflection of the collimated laser; the phase shift component is arranged in the transmission direction of the light splitting device and is used for driving the volume holographic grating to move; the reflector is arranged in the light outgoing direction of the volume holographic grating and used for reflecting the emergent light of the volume holographic grating through the front surface and the back surface respectively and returning the emergent light to the light splitting device; and the imaging device is arranged in the reflection direction of the light splitting device and used for receiving the light reflected by the light splitting device to form an interference image. The laser light source in the invention can be replaced, so that the wave front error result of the full working spectrum can be obtained, and the wave front detection precision is extremely high by adopting the phase shift interference principle.



**CLAIM 1.** A volume holographic grating diffractive wavefront measurement system, comprising: a laser light source for emitting laser light; the beam expanding and collimating lens is arranged in the emitting direction of the laser light source and is used for expanding and collimating the laser into a collimated laser beam; the beam expanding and collimating lens is arranged at the front end of the beam expanding and collimating lens and is used for expanding the beam expanding and collimating lens; the phase shift component is arranged in the transmission direction of the light splitting device and is used for driving the volume holographic grating to move; the reflector is arranged in the light outgoing direction of the volume holographic grating and used for reflecting the outgoing light of the volume holographic grating through the front surface and the back surface respectively and returning the outgoing light to the light splitting device in the original path; and the imaging device is arranged in the reflection direction of the light splitting device and is used for receiving the light reflected by the light splitting device to obtain an interference image.

N8671

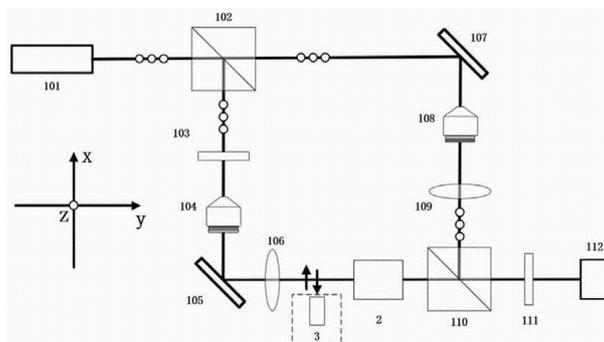
CN114459342

Priority Date: 25/01/2022

SOUTH CHINA NORMAL UNIVERSITY

### COAXIAL AND OFF-AXIS DIGITAL HOLOGRAPHIC SWITCHING DEVICE BASED ON PARALLEL BEAM SPLITTING PRISM

The embodiment of the invention provides a coaxial and off-axis digital holographic switching device based on a parallel beam splitting prism, which is characterized in that after a half-wave plate and a parallel beam splitting polarizer are inserted into a light path of reference light, the half-wave plate is rotated to a first preset angle or a second preset angle to control the polarization state of the reference light when the reference light enters the parallel beam splitting polarizer, so that the propagation direction of the reference light is deflected or not deflected, and an off-axis digital holographic system or a coaxial digital holographic system is obtained; or the switching device inserts the half-wave plate into the optical path of the reference light, and controls the parallel beam splitting polarizer to slide in or out of the optical path of the reference light after rotating the half-wave plate to a first preset angle, so as to obtain a coaxial digital holographic system or an off-axis digital holographic system; the on-axis digital holographic system or the off-axis digital holographic system can be selected according to the actual measurement requirement, the advantages of the on-axis digital holographic system and the off-axis digital holographic system are integrated, other parts of the system do not need to be adjusted, and the operation is simple and fast.



**CLAIM 1.** A coaxial and off-axis digital holographic switching device based on a parallel beam splitting prism is characterized by comprising an implanted interference-free digital holographic system and a coaxial and off-axis switching device; the implanted interference-free digital holographic system is used for splitting laser into object light and reference light and respectively transmitting the object light and the reference light to a first non-polarizing beam splitter prism, and a polarizing plate and a CCD image sensor are arranged on one side of the first non-polarizing beam splitter prism; the off-axis and on-axis switching device comprises a half-wave plate, a parallel beam splitting polarizing prism and a switching device; the switching device is used for inserting the half-wave plate and the parallel beam-splitting polarizer into the light path of the reference light, rotating the half-wave plate to a first preset angle or a second preset angle to control the polarization state of the reference light when the reference light enters the parallel beam-splitting polarizer, so as to control the translation amount of the reference light emitted by the parallel beam-splitting polarizer, and enabling the reference light to be deflected or not to be deflected in the propagation direction before the object light and the reference light are combined at the first non-polarization beam-splitting prism, so as to obtain an off-axis digital holographic system or an on-axis digital holographic system; or The switching device is used for inserting the half-wave plate into the optical path of the reference light, and controlling the parallel beam splitting polarizer to slide in or out of the optical path of the reference light after rotating the half-wave plate to a first preset angle, so as to obtain a coaxial digital holographic system or an off-axis digital holographic system.

*Click on the title to return to table of contents*

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

**P26406**

**OVD – PRINTING – BANKNOTE**

**N8669**

**CN114475035**

**ZHEJIANG YAXIN PACKAGING MAT**

*Priority Date: 21/01/2022*

### **PRODUCTION METHOD OF HOLOGRAPHIC TRANSFER FILM FOR FRAME PAPER**

The invention relates to a production method of a holographic transfer film for frame paper, which comprises a base film and a coating coated on the surface of the base film, wherein a laser layer molded by a fixed-length die pressing process is arranged on the coating, an aluminum plated layer plated with aluminum by vacuum aluminum plating is arranged on the laser layer, and the production method sequentially comprises the following steps: selection of S1 basal membrane, coating of S2 basal membrane, fixed-length die pressing of S3 and aluminum plating of S4, the invention has the advantages that: the base film with the fracture elongation of 80-120% is selected in S1, so that the base film can be effectively guaranteed to have good stretching rate, the positioning accuracy of the base film can be improved, when the base film is coated with paint prepared from isooctyl acrylate, n-propyl acetate, propylene glycol methyl ether, n-propanol, adipic acid and ethyl acetate, the requirement of imprinting on a fixed-length molding press can be met, a laser layer is molded by a fixed-length molding process, the original transfer film with an irregular length range can be stretched within a certain range, and the prepared frame paper can meet more choices.

**CLAIM 1.** A production method of a holographic transfer film for frame paper is characterized by comprising the following steps: the coating comprises a base film and a coating coated on the surface of the base film, wherein a laser layer molded by a fixed-length die pressing process is arranged on the coating, an aluminum plating layer plated with aluminum in vacuum is arranged on the laser layer, the coating is formed by coating paint, and the paint comprises the following components: 30-50 parts by weight of isooctyl acrylate, 10-15 parts by weight of n-propyl acetate, 8-12 parts by weight of propylene glycol methyl ether, 2-6 parts by weight of n-propanol, 5-10 parts by weight of adipic acid and 6-10 parts by weight of ethyl acetate; the production method sequentially comprises the following steps: s1: selection of a base membrane: obtaining a base film with the elongation at break of 80-120%, wherein the haze of the base film is 4-6%; s2: coating a base film: coating a coating prepared from isooctyl acrylate, n-propyl acetate, propylene glycol methyl ether, n-propanol, adipic acid and ethyl acetate on the surface of the base film obtained in S1, and drying the base film; s3, fixed-length die pressing: pressing the base film coated and dried by S2 to form a laser layer by a fixed-length pressing process, arranging a publishing gap on the base film before pressing, controlling the plate gap within 0.15mm, controlling the pressing temperature to be 170-180 and the pressing speed to be 50-60 m/min; s4: aluminum plating: and plating an aluminum plating layer on the surface of the base film subjected to fixed-length die pressing of S3 by a vacuum aluminum plating process.

*Click on the title to return to table of contents*

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

**N8619**

**WO2022103020**

Priority Date: 13/11/2020

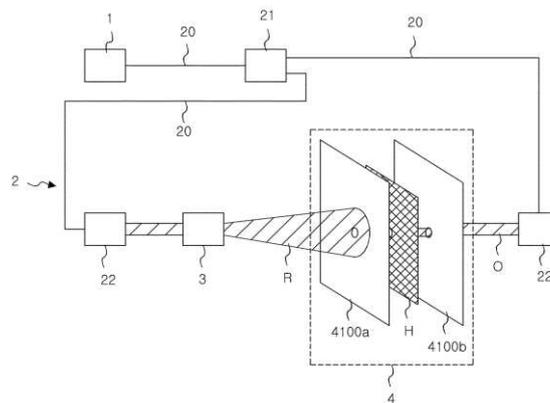
**KOREA ELECTRONICS TECHNOLOGY INSTITUTE | KYUNGPOOK NATIONAL UNIVERSITY INDUSTRY ACADEMIC COOPERATION FOUNDATION**

**HOLOGRAPHIC PRINTER ADJUSTING DIRECTION OF OBJECT LIGHT AND REFERENCE LIGHT IN HOHEL UNITS**

The present invention relates to a holographic printer adjusting the direction of an object light and a reference light in hogel units. According to the present invention, provided is a holographic printer, adjusting the direction of an object light and a reference light in hogel units, comprising: a light source; an optical fiber-based splitter for splitting a light concentrated from the light source into an object light and a reference light; and a hologram recording unit capable of adjusting the direction and location of the object light and reference light, having a holographic medium disposed therein, and enabling the printing of a hogel on the holographic medium by means of interference of the object light and reference light.

**IMPRIMANTE HOLOGRAPHIQUE AJUSTANT LA DIRECTION D'UNE LUMIÈRE D'OBJET ET D'UNE LUMIÈRE DE RÉFÉRENCE EN UNITÉS DE HOHEL**

La présente invention concerne une imprimante holographique qui ajuste la direction d'une lumière d'objet et d'une lumière de référence en unités de hogel. Selon la présente invention, une imprimante holographique qui ajuste la direction d'une lumière d'objet et d'une lumière de référence en unités de hogel comprend : une source de lumière ; un diviseur à base de fibre optique servant à diviser une lumière concentrée à partir de la source de lumière en une lumière d'objet et une lumière de référence ; et une unité d'enregistrement d'hologramme qui est capable d'ajuster la direction et l'emplacement de la lumière d'objet et de la lumière de référence, qui comporte un milieu holographique à l'intérieur de celle-ci, et qui permet l'impression d'un hogel sur le support holographique au moyen d'une interférence de la lumière d'objet et de la lumière de référence.



**CLAIM 1.** A holographic printer for adjusting directions of object light and reference light in units of hogel, A light source; An optical fiber based separator to distribute the collected light from the light source into object light and reference light, and And a hologram recording unit capable of adjusting a direction and a position of the object and reference light, wherein a holographic medium is disposed and interference between the object and reference light is performed so that a hogel is printed on the holographic medium.

N8627

US20220155503

Priority Date: 16/11/2020

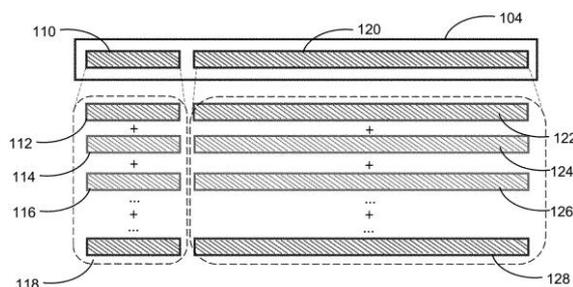
FACEBOOK TECHNOLOGIES

### CHEMICAL DIFFUSION TREATED VOLUME HOLOGRAMS AND METHODS FOR MAKING THE SAME

A method for making an optical grating having a non-uniform refractive index profile along a direction substantially perpendicular to a plane defined by the optical grating includes placing a layer of photopolymerization material having a first surface and a second surface that is opposite to the first surface between a first material transfer layer and a second material transfer layer so that the first surface of the layer of photopolymerization material is in contact with the first material transfer layer and the second surface of the layer of photopolymerization material is in contact with the second material transfer layer to allow material transfer between the layer of photopolymerization material and the first and second material transfer layers by diffusion.

### HOLOGRAMMES VOLUMIQUES TRAITÉS PAR DIFFUSION CHIMIQUE ET LEURS PROCÉDÉS DE FABRICATION

La présente invention concerne un procédé de fabrication d'un réseau optique, présentant un profil d'indice de réfraction non uniforme le long d'une direction sensiblement perpendiculaire à un plan défini par le réseau optique, qui consiste à disposer une couche de matériau de photopolymérisation présentant une première surface et une seconde surface qui est en regard de la première surface entre une première couche de transfert de matériau et une seconde couche de transfert de matériau de sorte que la première surface de la couche de matériau de photopolymérisation se trouve en contact avec la première couche de transfert de matériau et que la seconde surface de la couche de matériau de photopolymérisation se trouve en contact avec la seconde couche de transfert de matériau pour permettre un transfert de matériau par diffusion entre la couche de matériau de photopolymérisation et les première et seconde couches de transfert de matériau.



**CLAIM 1.** A method, comprising: making an optical grating having a non-uniform refractive index profile along a direction substantially perpendicular to a plane defined by the optical grating, including placing a layer of photopolymerization material having a first surface and a second surface that is opposite to the first surface between a first material transfer layer and a second material transfer layer so that the first surface of the layer of photopolymerization material is in contact with the first material transfer layer and the second surface of the layer of photopolymerization material is in contact with the second material transfer layer to allow material transfer between the layer of photopolymerization material and the first and second material transfer layers by diffusion.

N8628

US20220153895

Priority Date: 13/11/2020

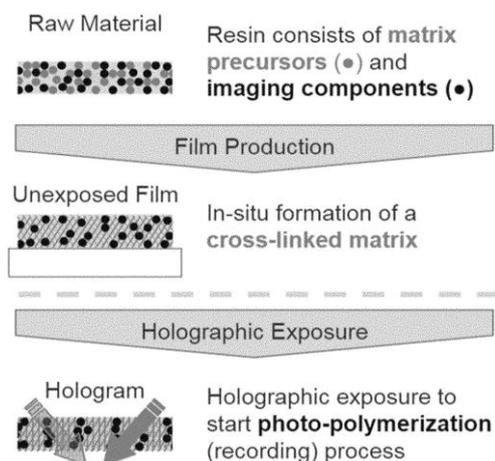
FACEBOOK TECHNOLOGIES

## SUBSTITUTED PROPANE-CORE MONOMERS AND POLYMERS THEREOF FOR VOLUME BRAGG GRATINGS

The disclosure provides recording materials including propane derivatized monomers and polymers for use in volume Bragg gratings, including, but not limited to, volume Bragg gratings for holography applications. Several structures are disclosed for propane derivatized monomers and polymers for use in Bragg gratings applications, leading to materials with higher refractive index, low birefringence, and high transparency. The disclosed propane derivatized monomers and polymers thereof can be used in any volume Bragg gratings materials, including two-stage polymer materials where a matrix is cured in a first step, and then the volume Bragg grating is written by way of a second curing step of a monomer.

## MONOMÈRES À NOYAUX DE TYPE PROPANE SUBSTITUÉS ET LEURS POLYMÈRES POUR RÉSEAUX DE BRAGG EN VOLUME

L'invention concerne des matériaux d'enregistrement comprenant des monomères et polymères dérivés de propane destinés à être utilisés dans des réseaux de Bragg en volume, notamment, mais non exclusivement, des réseaux de Bragg en volume pour des applications holographiques. Sont divulguées plusieurs structures pour des monomères et polymères dérivés de propane destinés à être utilisés dans des applications de réseaux de Bragg, permettant d'obtenir des matériaux ayant un indice de réfraction supérieur, une faible biréfringence et une transparence élevée. Les monomères et polymères dérivés de propane divulgués peuvent être utilisés dans tous les matériaux pour réseaux de Bragg en volume, y compris les matériaux polymères s'obtenant en deux étapes, une matrice étant durcie dans une première étape, puis le réseau de Bragg en volume étant inscrit à l'aide d'une seconde étape de durcissement d'un monomère.



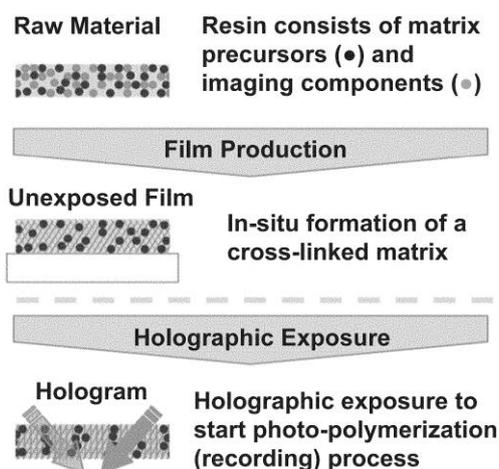
**CLAIM 1.** A compound of Formula I: wherein in Formula I: R is at each independent occurrence hydrogen or a substituent comprising one or more groups selected from optionally substituted alkyl, optionally substituted heteroalkyl, optionally substituted alkenyl, optionally substituted alkynyl, optionally substituted cycloalkyl, optionally substituted heterocycloalkyl, optionally substituted aryl, optionally substituted arylalkyl, optionally substituted heteroaryl, optionally substituted heteroarylalkyl, hydroxy, halo, cyano, trifluoromethyl, trifluoromethoxy, nitro, trimethylsilyl, optionally substituted epoxide, optionally substituted glycidyl, optionally substituted acrylate, optionally substituted methacrylate, -ORa, -SRa, -OC(O)-Ra, -N(Ra)<sub>2</sub>, -C(O)Ra, -C(O)ORa, -C(O)SRa, -SC(O)Ra, -OC(O)ORa, -OC(O)N(Ra)<sub>2</sub>, -C(O)N(Ra)<sub>2</sub>, -N(Ra)C(O)ORa, -N(Ra)C(O)Ra, -N(Ra)C(O)N(Ra)<sub>2</sub>, -N(Ra)C(NRa)N(Ra)<sub>2</sub>, -N(Ra)S(O)tRa, -S(O)tRa, -S(O)tORa, -S(O)tN(Ra)<sub>2</sub>, -S(O)tN(Ra)C(O)Ra, -O(O)P(ORa)<sub>2</sub>, and -O(S)P(ORa)<sub>2</sub>; t is 1 or 2; Ra is independently selected at each occurrence from hydrogen, optionally substituted alkyl, optionally substituted heteroalkyl, optionally substituted alkenyl, optionally substituted alkynyl, optionally substituted cycloalkyl, optionally substituted heterocycloalkyl, optionally substituted aryl, optionally substituted arylalkyl, optionally substituted heteroaryl, and optionally substituted heteroarylalkyl; and wherein the compound of Formula I comprises at least one R substituent comprising at least one polymerizable or crosslinkable group.

## SUBSTITUTED MONO- AND POLY-PHENYL-CORE MONOMERS AND POLYMERS THEREOF FOR VOLUME BRAGG GRATINGS

The disclosure provides recording materials including mono- or poly-phenyl-core derivatized monomers and polymers for use in volume Bragg gratings, including, but not limited to, volume Bragg gratings for holography applications. Several structures are disclosed for mono- or poly-phenyl-core derivatized monomers and polymers for use in Bragg gratings applications, leading to materials with higher refractive index, low birefringence, and high transparency. The disclosed mono- or poly-phenyl-core derivatized monomers and polymers thereof can be used in any volume Bragg gratings materials, including two-stage polymer materials where a matrix is cured in a first step, and then the volume Bragg grating is written by way of a second curing step of a monomer.

## MONOMÈRES À NOYAUX MONOPHÉNYLE ET POLYPHÉNYLE SUBSTITUÉS ET LEURS POLYMÈRES POUR RÉSEAUX DE BRAGG EN VOLUME

La divulgation concerne des matériaux d'enregistrement comprenant des monomères et polymères dérivés à noyaux monophényle ou polyphényle destinés à être utilisés dans des réseaux de Bragg en volume, notamment, mais non exclusivement, des réseaux de Bragg en volume pour des applications holographiques. Sont divulguées plusieurs structures pour des monomères et polymères dérivés à noyaux monophényle ou polyphényle destinés à être utilisés dans des applications de réseaux de Bragg, permettant d'obtenir des matériaux ayant un indice de réfraction supérieur, une faible biréfringence et une transparence élevée. Les monomères et polymères dérivés à noyaux monophényle ou polyphényle divulgués peuvent être utilisés dans tous les matériaux pour réseaux de Bragg en volume, y compris les matériaux polymères s'obtenant en deux étapes, une matrice étant durcie dans une première étape, puis le réseau de Bragg en volume étant inscrit à l'aide d'une seconde étape de durcissement d'un monomère.



**CLAIM 1.** A compound of any one of Formulas I-IV: wherein in Formulas I-IV: R is at each independent occurrence hydrogen or a substituent comprising one or more groups selected from optionally substituted alkyl, optionally substituted heteroalkyl, optionally substituted alkenyl, optionally substituted alkynyl, optionally substituted cycloalkyl, optionally substituted heterocycloalkyl, optionally substituted aryl, optionally substituted arylalkyl, optionally substituted heteroaryl, optionally substituted heteroarylalkyl, hydroxy, halo, cyano, trifluoromethyl, trifluoromethoxy, nitro, trimethylsilyl, optionally substituted epoxide, optionally substituted glycidyl, optionally substituted acrylate, optionally substituted methacrylate, -ORa, -SRa, -OC(O)-Ra, -N(Ra)<sub>2</sub>, -C(O)Ra, -C(O)ORa, -C(O)SRa, -SC(O)Ra, -OC(O)ORa, -OC(O)N(Ra)<sub>2</sub>, -C(O)N(Ra)<sub>2</sub>, -N(Ra)C(O)ORa, -N(Ra)C(O)Ra, -N(Ra)C(O)N(Ra)<sub>2</sub>, -N(Ra)C(NRa)N(Ra)<sub>2</sub>, -N(Ra)S(O)tRa, -S(O)tRa, -S(O)tORa, -S(O)tN(Ra)<sub>2</sub>, -S(O)tN(Ra)C(O)Ra, -O(O)P(ORa)<sub>2</sub>, and -O(S)P(ORa)<sub>2</sub>, wherein two adjacent R substituents can bond or fuse to form a ring; t is 1 or 2; Ra is independently selected at each occurrence from hydrogen, optionally substituted alkyl, optionally substituted heteroalkyl, optionally substituted alkenyl, optionally substituted alkynyl, optionally substituted cycloalkyl, optionally substituted heterocycloalkyl, optionally substituted aryl, optionally substituted arylalkyl, optionally substituted heteroaryl, and optionally substituted heteroarylalkyl; an wherein the compound of any one of Formulas I-IV comprises at least one R substituent comprising at least one polymerizable or crosslinkable group.

N8634

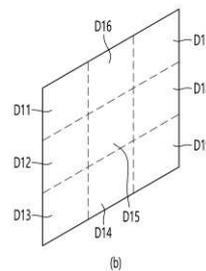
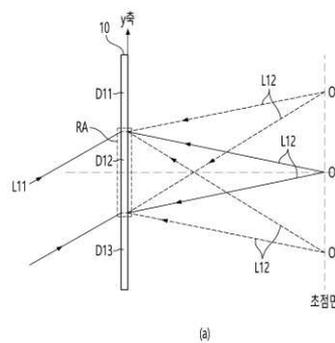
KR20220064834

Priority Date: 12/11/2020

## HANGYO HOLOGRAM

### HOLOGRAM RECORDING APPARATUS AND METHOD

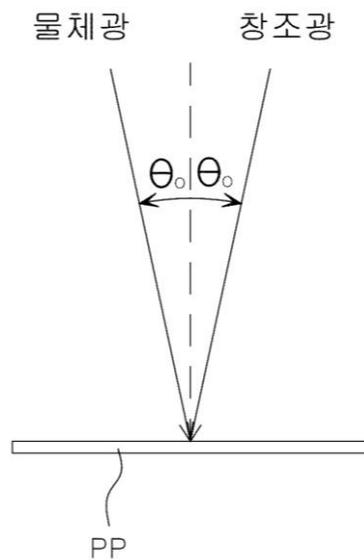
The present invention relates to a hologram recording apparatus including a reference light generating module for generating reference light and irradiating the reference light to a recording position of a hologram recording medium, an object light generating module configured to generate object light and irradiate the object light to the recording position of a hologram recording medium; and a moving module connected to the hologram recording medium and configured to move the hologram recording medium in at least one of a row direction and a column direction, A first driving module configured to move one divided area of the plurality of divided areas of the hologram recording medium to the recording position, and a second driving module connected to the object light generating module, And a second driving module configured to move the object light generating module in at least one of a row direction and a column direction to position the object light generating module at a focal position for the one divided region, and rotate the object light generating module by a corresponding angle in the direction to irradiate the object light to the recording position.



**CLAIM 1.** A hologram recording apparatus comprising: a reference light generating module configured to generate reference light and irradiate the reference light to a recording position of a hologram recording medium; an object light generating module configured to generate object light and irradiate the object light to the recording position of the hologram recording medium; a control module connected to the hologram recording medium, A first driving module that moves the hologram recording medium in at least one of a row direction and a column direction to move one divided area among a plurality of divided areas of the hologram recording medium to the recording position; And a controller connected to the object light generating module and configured to move the object light generating module in at least one of a row direction and a column direction to position the object light generating module at a focal position for the one divided region, And a second driving module configured to rotate the object light generating module by a corresponding angle in the direction so that the object light is irradiated to the recording position.

**METHOD FOR WRITING RGB COLOR IMAGES TO PHOTORESIST PLATES WITH SURFACE IRREGULARITIES HOLOGRAMS USING A SINGLE LASER LIGHT SOURCE**

The present invention relates to a method for recording a surface irregularity hologram on a photoresist plate, the method comprising the steps of: preparing a stereoscopic image and converting the stereoscopic image into a plurality of consecutive plane images, And then convert them into a single Red, Green, Blue stereoscopic image: calculating pitches  $d_1$   $\{\lambda_1$  (red)},  $d_2$   $\{\lambda_2$  (green)},  $d_3$   $\{\lambda_3$  (blue)}, respectively, of diffractive optical elements capable of producing first-order diffracted light: A laser light source having an arbitrary wavelength  $\lambda_0$  and first, second and third diffraction optical elements (DOEs), respectively, at least one of pitches  $d_1$   $\{\lambda_1$  (red)},  $d_2$   $\{\lambda_2$  (green)}, Calculating illumination angles of each of the object light and the reference light for generating gratings corresponding to each of  $D_3$   $\{\lambda_3$  (blue)}, and sequentially irradiating Red, Green, and Blue stereoscopic images to one surface of the photoresist plate according to the calculated illumination angles.



**CLAIM 1.** A stereoscopic image processing method, comprising: preparing a stereoscopic image; converting the stereoscopic image into a plurality of continuous planar images at different angles; splitting each of the plurality of planar images into Red, Green, and Blue, respectively; splitting each of the plurality of planar images split into Red, Green, and Blue, Into a Blue stereoscopic image: a first step capable of generating first-order diffracted light at representative wavelengths 1 (red), 2 (green) and 3 (blue), respectively, of illumination means used in reproducing the hologram, 2,3Calculating the pitches  $d_1$   $\{1$  (red)},  $d_2$   $\{2$  (green)},  $d_3$   $\{3$  (blue)}, respectively, of the diffractive optical element DOEs: a laser light source having an arbitrary wavelength  $\lambda_0$  and a first, Calculating illumination angles of each of the object light and the reference light for producing a grating corresponding to each of pitches  $d_1$   $\{1$  (red)},  $d_2$   $\{2$  (green)},  $d_3$   $\{3$  (blue)} in a photoresist plate using each of diffraction optical elements (DOEs): A laser light source having an arbitrary wavelength  $\lambda_0$  is formed by a first step having pitches  $d_1$   $\{1$  (red)},  $d_2$   $\{2$  (green)},  $d_3$   $\{3$  (blue)}, And sequentially irradiating Red, Green, and Blue stereoscopic images onto one surface of the photoresist plate according to the calculated respective illumination angles of the object light and reference light diffracted by each of the Diffraction Optical Elements (DOEs).

N8640

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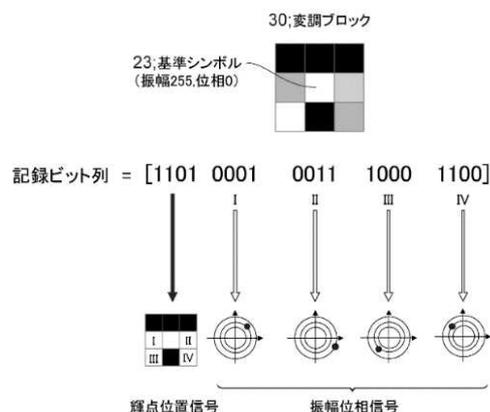
Priority Date: 07/10/2020

JAPAN BROADCASTING

### HOLOGRAM RECORDING/REPRODUCTION METHOD AND HOLOGRAM RECORDING/REPRODUCTION DEVICE

TOPIC: To provide a hologram recording/reproduction method and device capable of reducing a network size for machine learning and significantly reducing recording capacity required for demodulation processing when demodulation of page data reproduced from a hologram recording medium. INVENTION: Page data recorded on a hologram recording medium for information recording is read, divided into modulation blocks (S6), first bit sequence data is demodulated by a first CNN for bright spots arranged in the modulation blocks, and The second CNN demodulates the amplitude phase signal superimposed on the bright spot to demodulate second bit sequence data (S7), and associates the demodulated two bit sequence data as one bit sequence data (S8).

CLAIM 1. Reads page data recorded on a hologram recording medium for information recording, divides the page data into modulation blocks, demodulates the first bit sequence data by a first machine learning process for spots of high intensities arranged in the modulation blocks, and Demodulation of second bit sequence data through second machine learning processing for the amplitude phase signal superimposed on the bright spot; and association of the demodulated two bit sequence data as one bit sequence data.



N8641

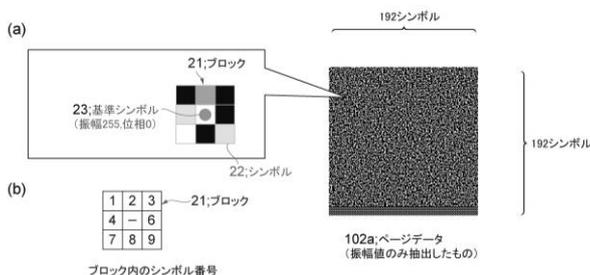
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Priority Date: 07/10/2020

JAPAN BROADCASTING

### MODULATION CODE GENERATION METHOD AND HOLOGRAM RECORDING/REPRODUCTION DEVICE

TOPIC: To provide a method of generating a modulation code and a hologram recording/reproduction device capable of reducing influence of noise during reproduction and reducing variation in reading values to reduce bit errors and restore data correctly, in a hologram technology with amplitude/phase multi-valued. INVENTION: a plurality of symbols 22 that are adjacent to each other and that are configured as image elements of page data 102 a based on an input signal to be recorded in a hologram recording medium for information recording, and that have at least binary gray scales; 23 to form a block 21, in which a complex amplitude value is given to each of symbols 22 and 23, a predetermined amplitude and a predetermined phase are given to at least one symbol 23 in the block 21, and the symbol 23 is configured as a reference symbol 23.



CLAIM 1. A method of generating a modulation code for forming a block by grouping a plurality of symbols adjacent to each other, the plurality of symbols being configured as image elements of page data based on an input signal, the plurality of symbols being recorded on a hologram recording medium for information recording, the method comprising: Adding a complex amplitude value to each of the symbols, adding a prescribed amplitude and a prescribed phase to at least one symbol in the block, and configuring the resultant symbol as a reference symbol.

N8646

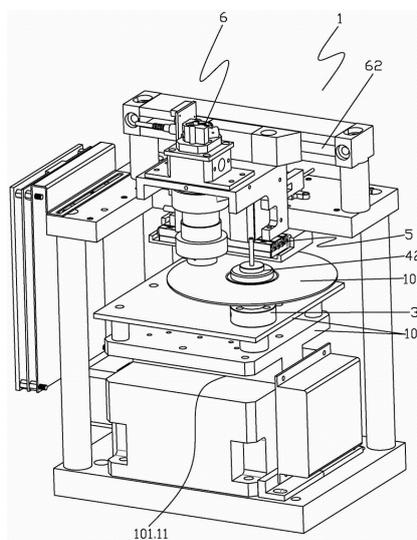
CN216596936U

Priority Date: 19/01/2022

ZHUHAI HENGQIN MEGA CAO PHOTOELECTRIC TECHNOLOGY

### HOLOGRAPHIC STORAGE NANOMETER FOCUSING AND TRACKING DEVICE

The utility model discloses a holographic storage nanometer focusing and tracking device, which comprises a base, wherein a positioning component for positioning a holographic optical disk is connected on the base, and a rotating component for driving the positioning component to rotate relative to the base is arranged between the positioning component and the base; a piezoelectric objective positioner used for capturing light spots on the holographic disk and recording and storing information on the holographic disk is arranged on the base and above the positioning component, and a moving component used for driving the piezoelectric objective positioner to move along the X-axis direction is arranged between the piezoelectric objective positioner and the base; the base is provided with a driving assembly for driving the piezoelectric objective lens positioner to move along the Z-axis direction relative to the positioning assembly, so that automatic focusing can be quickly realized, light spots on the optical disk can be captured, and storage information can be recorded on the holographic optical disk.



**CLAIM 1.** A holographic storage nanometer focusing and tracking device is characterized by comprising a base (1), wherein a positioning component (4) for positioning a holographic optical disk (100) is connected to the base (1), and a rotating component (3) for driving the positioning component (4) to rotate relative to the base (1) is arranged between the positioning component (4) and the base (1); a piezoelectric objective lens positioner (6) used for capturing light spots on the holographic optical disk (100) and recording and storing information on the holographic optical disk (100) is arranged on the base (1) and above the positioning assembly (4), and a moving assembly (5) used for driving the piezoelectric objective lens positioner (6) to move along the X-axis direction is arranged between the piezoelectric objective lens positioner (6) and the base (1); the base (1) is provided with a driving assembly (2) for driving the piezoelectric objective positioner (6) to move along the Z-axis direction relative to the positioning assembly (4); or the base (1) is provided with a driving component (2) for driving the positioning component (4) to move along the Z-axis direction relative to the piezoelectric objective lens positioner (6); or the base (1) is provided with a driving assembly (2) for driving the piezoelectric objective lens positioner (6) and the positioning assembly (4) to approach or move away from each other.

N8661

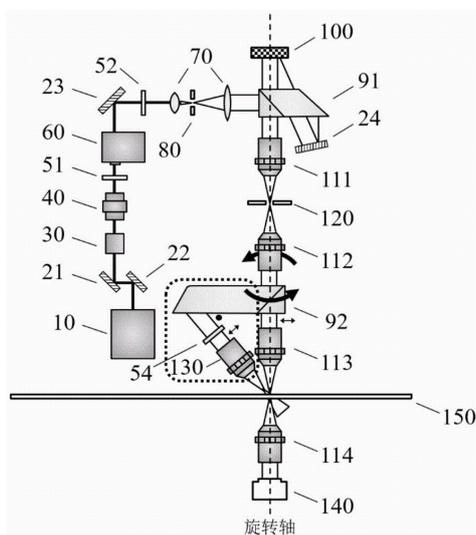
CN216362047U

Priority Date: 07/09/2021

## GUANGDONG ZIJING INFORMATION STORAGE TECHNOLOGY

### RECORDING AND REPRODUCING APPARATUS FOR INCREASING HOLOGRAM RECORDING SPEED IN CROSS-SHIFT MULTIPLEXING

The utility model provides a recording and reproducing device for improving the recording speed of a hologram in cross-shift multiplexing, which comprises a light source, a reference light path, a signal light path, a reading device and a medium platform; the light source is divided into reference light and signal light, and the reference light and the signal light interfere on a storage medium supported by the medium platform and form a hologram; reproducing signal light carrying data information when the reference light is irradiated on a position where the hologram is recorded on the medium; the reading device is used for reading the data information reproduced by the reference light; the medium platform also comprises a medium moving device, the medium moving device is used for translating and/or rotating the storage medium supported by the medium platform, and the optical axis direction of the signal light is perpendicular to the storage medium; the reference optical path includes a reference optical path rotating structure for rotating about an optical axis of the signal light. The device changes the vector direction of the grating formed by interference by rotating the optical head, realizes cross multiplexing recording of the hologram, does not need complex position movement of the medium, and reduces the position control requirement of the medium.



**CLAIM 1.** A recording and reproducing apparatus for increasing a hologram recording speed in cross-shift multiplexing includes a light source, a reference light path, a signal light path, a reading device, and a medium stage; the light source is divided into two beams, wherein reference light which is transmitted to the storage medium through the reference light path and does not carry data information is adopted, and signal light which is transmitted through the signal light path and carries data information is adopted; the reference light and the signal light interfere on a storage medium supported by a medium platform, and interference fringes are recorded in the storage medium through exposure to form a hologram; when the reference light irradiates on the position of the storage medium where the hologram is recorded, the signal light carrying the data information can be reproduced; the reading device is used for reading the data information reproduced by the reference light; the media platform further comprising a media movement device for translating and/or rotating a storage medium supported by the media platform, the optical axis direction of the signal light is perpendicular to the storage medium; the reference optical path includes a reference optical path rotating structure for rotating around an optical axis of the signal light.

*Click on the title to return to table of contents*

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

**N8618**

**WO2022107962**

Priority Date: 19/11/2020

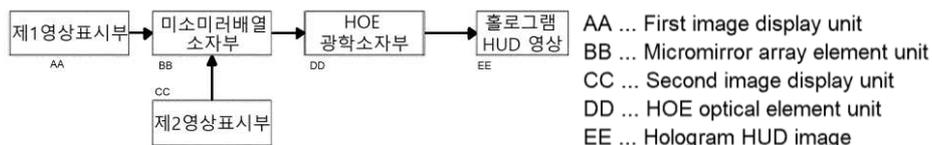
**HOLOLAB**

**SYSTEM AND OPERATION METHOD FOR HOLOGRAPHIC HEAD-UP DISPLAY BASED ON MICROMIRROR ARRAY ELEMENT**

The present invention relates to an operation method for a holographic head-up display based on a micromirror array element, wherein a first image and a second image are formed in a holographic HUD module for an operator of the operation method to observe a hologram image in two different regions, and in order to display a short distance-long distance image, one in-depth 3D image is formed via a micromirror array element (30) by using a first image display unit (10) and a second image display unit (20) simultaneously, and the 3D image thus formed is depicted as a hologram image via a HOE element (40). In addition, the present invention relates to a holographic head-up display system based on a micromirror array element, comprising: a first image display unit (10) displaying a short-distance image; a second image display unit (20) displaying a long-distance image; a micromirror array element unit (30) placing images displayed on the first image display unit and the second image display unit such that the images are spatially different from each other; and a HOE element unit (40) transforming a 3D image formed by the micromirror array element unit into a hologram HUD image. By using the micromirror array element to display two different distances, a long distance and a short distance, according to a velocity or an environment around a vehicle, the present invention has a significant effect of providing a safe and comfortable hologram HUD image that takes into consideration a driver's focus adjustment function.

**SYSTÈME ET PROCÉDÉ DE FONCTIONNEMENT POUR UN AFFICHAGE TÊTE HAUTE HOLOGRAPHIQUE BASÉ SUR UN ÉLÉMENT DE RÉSEAU DE MICROMIROIRS**

La présente invention concerne un procédé de fonctionnement pour un affichage tête haute holographique basé sur un élément de réseau de micromiroirs, une première image et une seconde image étant formées dans un module HUD holographique pour un opérateur du procédé de fonctionnement pour observer une image d'hologramme dans deux régions différentes, et pour afficher une image à courte distance à courte distance, une image 3D en profondeur est formée par l'intermédiaire d'un élément de réseau de micromiroirs (30) en utilisant une première unité d'affichage d'image (10) et une seconde unité d'affichage d'image (20) simultanément, et l'image 3D ainsi formée est représentée sous la forme d'une image d'hologramme par l'intermédiaire d'un élément HOE (40). De plus, la présente invention concerne un système d'affichage tête haute holographique basé sur un élément de réseau de micromiroirs, comprenant : une première unité d'affichage d'image (10) affichant une image à courte distance ; une seconde unité d'affichage d'image (20) affichant une image à longue distance ; une unité d'élément de réseau de micromiroirs (30) à placer des images affichées sur la première unité d'affichage d'image et la seconde unité d'affichage d'image de telle sorte que les images soient spatialement différentes l'une de l'autre ; et une unité d'élément HOE (40) transformant une image 3D formée par l'unité d'élément de réseau de micromiroirs en une image HUD d'hologramme. En utilisant l'élément de réseau de micromiroirs pour afficher deux distances différentes, une longue distance et une courte distance, en fonction d'une vitesse ou d'un environnement autour d'un véhicule, la présente invention a pour effet significatif de fournir une image HUD d'hologramme sûr et confortable qui prend en considération la fonction de réglage de la mise au point du conducteur.



AA ... First image display unit  
 BB ... Micromirror array element unit  
 CC ... Second image display unit  
 DD ... HOE optical element unit  
 EE ... Hologram HUD image

**CLAIM 1.** A first image (13) and a second image (23) are produced in a holographic HUD module for the driver to observe holographic images in two different areas, wherein a single depth 3 D image is produced through a micromirror array (30) by simultaneously using a first image display (10) and a second image display (20) for displaying near-far images, A method for operating a holographic head-up display based on a micromirror array element, in which a holographic image is reproduced through an hoe element (40).

N8620

WO2022101194

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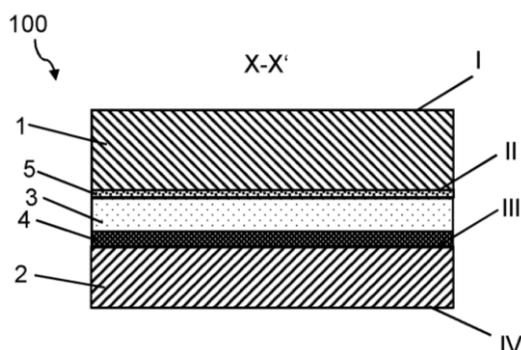
SAINT GOBAIN GLASS

### LAMINATED PANE COMPRISING A HOLOGRAM ELEMENT AND AN ELECTROCHROMIC FUNCTIONAL ELEMENT

The invention relates to a laminated pane (100), at least comprising: an outer pane (1), which has an outer surface (I) and an inner surface (II); a first intermediate layer (3); a hologram element (4); an electrochromic functional element (5); and an inner pane (2), which has an outer surface (III) and an inner surface (IV). The hologram element (4) is situated between the outer pane (1) and the inner pane (2); the first intermediate layer (3) is situated between the outer pane (1) and the hologram element (4) or between the inner pane (2) and the hologram element (4); the electrochromic functional element (5) is situated in a region of the laminated pane (100) in the form of a coating on the inner surface (II) of the outer pane (1); and the hologram element (4), when viewed perpendicularly through the laminated pane (100), is situated completely within the region in which the electrochromic functional element (5) is situated.

### VITRE STRATIFIÉE COMPRENANT UN ÉLÉMENT D'HOLOGRAMME ET UN ÉLÉMENT FONCTIONNEL ÉLECTROCHROME

L'invention concerne une vitre stratifiée (100), comprenant au moins : une vitre externe (1), qui a une surface externe (I) et une surface interne (II) ; une première couche intermédiaire (3) ; un élément d'hologramme (4) ; un élément fonctionnel électrochrome (5) ; et une vitre interne (2), qui a une surface externe (III) et une surface interne (IV). L'élément d'hologramme (4) est situé entre la vitre externe (1) et la vitre interne (2) ; la première couche intermédiaire (3) est située entre la vitre externe (1) et l'élément d'hologramme (4) ou entre la vitre interne (2) et l'élément d'hologramme (4) ; l'élément fonctionnel électrochrome (5) est situé dans une région de la vitre stratifiée (100) sous la forme d'un revêtement sur la surface interne (II) de la vitre externe (1) ; et l'élément d'hologramme (4), lorsqu'il est vu perpendiculairement à travers la vitre stratifiée (100), est entièrement situé à l'intérieur de la région dans laquelle est situé l'élément fonctionnel électrochrome (5).



**CLAIM 1.** Patent claims composite pane (100), at least comprising an outer pane (1) with an outer surface (I) and an inner surface (II), a first intermediate layer (3), a hologram element (4), an electrochromic functional element (5) and an inner pane (2) with an outer surface (III) and an inner surface (IV), wherein the hologram element (4) is arranged between the outer pane (1) and the inner pane (2), the first intermediate layer (3) is arranged between the outer pane (1) and the hologram element (4) or between the inner pane (2) and the hologram element (4), the electrochromic functional element (5) is arranged as a coating on the inner surface (II) of the outer pane (1) in a region of the composite pane (100), and the hologram element (4) is arranged completely within the region in which the electrochromic functional element (5) is arranged in a perpendicular view through the composite pane (100). Composite pane according to claim 1, wherein the hologram element (4) comprises a holographic material and optionally a first substrate layer and/or a second substrate layer.

N8621

WO202290232

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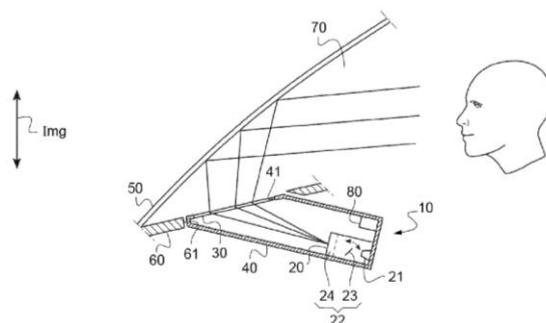
VALEO COMFORT & DRIVING ASSISTANCE

### HEAD-UP DISPLAY WITH HOLOGRAPHIC SLIDE

The invention relates to a head-up display (10) for a motor vehicle, comprising a housing (40), an image-forming device (20) housed inside the housing and designed to generate a raw image, and an image-returning system fixed to the housing. According to the invention, the image-returning system comprises a holographic slide (30) that completely closes off a window (41) formed in the housing, which is arranged to receive the raw image generated by the image-forming device and which is designed to magnify said raw image.

### AFFICHEUR TÊTE-HAUTE À LAME HOLOGRAPHIQUE

L'invention concerne un afficheur tête-haute (10) pour véhicule automobile, comportant un boîtier (40), un dispositif de formation d'images (20) logé à l'intérieur du boîtier et adapté à générer une image brute, et un système de renvoi d'images fixé au boîtier. Selon l'invention, le système de renvoi d'images comporte une lame holographique (30) qui ferme entièrement une fenêtre (41) pratiquée dans le boîtier, qui est agencée pour recevoir l'image brute générée par le dispositif de formation d'images et qui est adaptée à grossir ladite image brute.



**CLAIM 1.** a head-up display (10) for a motor vehicle, comprising: - a housing (40), - an imaging device (20) housed within the housing (40) and adapted to generate a raw image, and - an image return system fixed to the housing (40), characterized in that the image return system comprises a holographic plate (30) which entirely closes a window (41) made in the housing (40), which is arranged to receive directly the raw image generated by the imaging device (20) and which is adapted to magnify said raw image.

N8624

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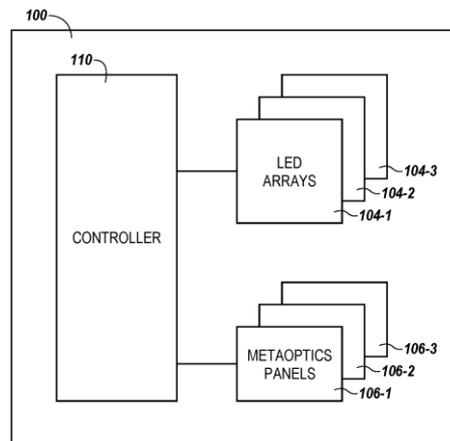
Priority Date: 24/11/2020

MICRON TECHNOLOGY

### STACKED LIGHT EMITTING DIODE (LED) HOLOGRAM DISPLAY

Embodiments of the present disclosure include apparatuses and method for a stacked light emitting diode (LED) hologram display. A stacked LED hologram display can include a first array of LEDs that are configured to emit red light received by a meta-optics panel configured to display a first portion of a holographic image, a second array of LEDs that are configured to emit green light received by a meta-optics panel configured to display a second portion of a holographic image, and a third array of LEDs that are configured to emit blue light received by a meta-optics panel configured to display a third portion of a holographic image. The stacked LED hologram display can include a number of actuators configured to adjust a position of a first array of LEDs in first direction and a second direction, adjust a position of a second array of LEDs in the first direction and the second direction, and adjust a position of a third array of LEDs in the first direction and the second direction.

**CLAIM 1.** A method, comprising: adjusting a position of a first array of light emitting diodes (LEDs) in a first direction and a second direction orthogonal to the first direction, the adjusting relative to an origin point of the first array, wherein the first array of LEDs are configured to emit red light in a red green blue (RGB) hologram display; displaying a first portion of a holographic image by a first meta-optics panel from light emitted by the first array; adjusting a position of a second array of LEDs in the first direction and the second direction relative to an origin point of the second array, wherein the second array of LEDs are configured to emit green light in the RGB display; displaying a second portion of the holographic image by a second meta-optics panel from light emitted by the second array; adjusting a position of a second array of LEDs in the first direction and the second direction relative to an origin point of the third array, wherein the third array of LEDs are configured to emit blue light in the RGB display and; and displaying a third portion of the holographic image by a third meta-optics panel from light emitted by the third array, wherein the first, second, and third arrays are stacked on each other.



N8625

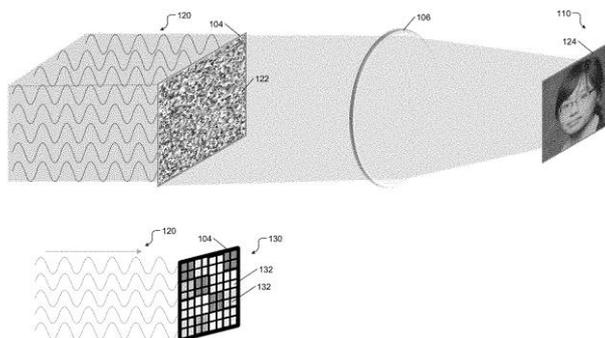
US20220163919

Priority Date: 23/11/2020

GM GLOBAL TECHNOLOGY OPERATIONS

### MICROMIRROR PIXEL DESIGN TO ELIMINATE INTENSITY ARTIFACTS IN HOLOGRAPHIC DISPLAYS

A spatial light modulator includes a semiconductor substrate and a plurality of micro-mirrors arranged on the semiconductor substrate to modulate light. Each of the micro-mirrors has a center and a perimeter. Each of the micro-mirrors includes a layer of a reflective material arranged on the semiconductor substrate. In each of the micro-mirrors, the layer of the reflective material extends horizontally from the center towards the perimeter for a predetermined distance and slopes downwards towards the semiconductor substrate after the predetermined distance.



**CLAIM 1.** A spatial light modulator comprising: a semiconductor substrate; and a plurality of micro-mirrors arranged on the semiconductor substrate to modulate light, wherein each of the micro-mirrors has a center and a perimeter; wherein each of the micro-mirrors includes a layer of a reflective material arranged on the semiconductor substrate; and wherein in each of the micro-mirrors, the layer of the reflective material: extends horizontally from the center towards the perimeter for a predetermined distance; and slopes downwards towards the semiconductor substrate after the predetermined distance.

N8626

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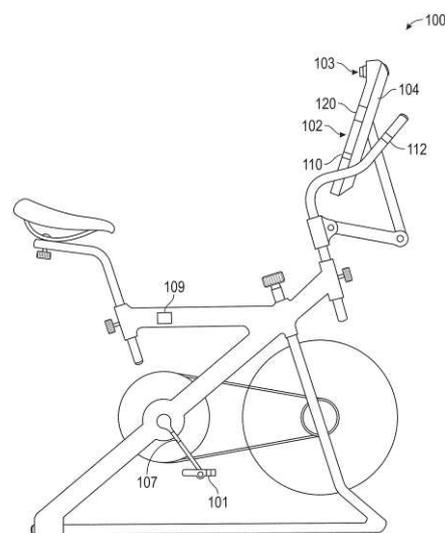
Priority Date: 25/11/2020

SAGA HOLOGRAPHIC

### EXERCISE APPARATUS WITH INTEGRATED HOLOGRAPHIC DISPLAY

Stationary exercise machine with integrated holographic display to simulate depth and motion is disclosed. The disclosure uses an integrated and responsive 3-dimensional (3D) or holographic display attached to and/or integrated with stationary exercise equipment to create a more immersive, engaging and enjoyable stationary exercise experience. The 3D or holographic display provides a more stimulating sensory experience and can better simulate the perception of depth and motion through a 3D virtual environment.

**CLAIM 1.** An exercise apparatus comprising: one or more sensors configured to capture user exercise data; a face-tracking camera configured to track the eye movements of a user of the exercise apparatus; a processor configured to receive the captured user exercise data from the one or more sensors, receive data on the eye movements of the user from the face-tracking camera, and generate a virtual environment based on the user exercise data and the eye movements of the user; and a display configured to display the virtual environment to the user.



N8631

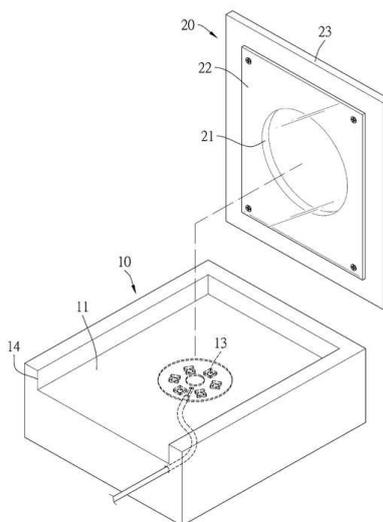
TWM625942

Priority Date: 24/11/2021

DAI DAOXUAN

### ORNAMENTS WITH HOLOGRAPHIC PROJECTION.

The present invention is an article of manufacture having a projection of a holographic image, comprising: a housing having a projection recess recessed from a top surface, the projection recess being adapted to receive an article for projection of a holographic image, the housing further having a polishing recess recessed from a bottom surface, the polishing recess having a projection lamp disposed therein; A projection fitting having a holographic image projection space formed therein, the projection fitting being provided for placement on the light transmitting sheet. Thus, the present invention has a variety of different types of decorative effects.



N8632

RU2771005

Priority Date: 22/07/2021

OBSHCHESTVO S OGRANICHENNOJ OTVETSTVENNOSTYU SMART  
ENDZHINS SERVIS

### METHOD FOR DETECTING HOLOGRAPHIC PROTECTION ON DOCUMENTS IN A VIDEO STREAM

FIELD: computer technology.

SUBSTANCE: invention relates to the field of computer technology for detecting holographic protection on documents in a video stream. To do this, a method for detecting holographic protection on documents in a video stream is claimed, including: searching for special points and calculating descriptors on the frame; filtering of singular points on the previous frame so that only points located inside the quadrilateral of the external borders of the document remain; comparison of descriptors of singular points of the current and previous frames; application of an algorithm for estimating the parameters of the projective transformation between frames; projective transformation of the quadrilateral of the external borders of the document from the previous frame to obtain the external borders of the document on the current frame; normalization of the document image; calculating saturation and color tone; updating the saturation and color tone statistics, while further pixels of the normalized image of the document are considered, the brightness values of which do not exceed the specified threshold; image filtering is performed.

EFFECT: increase in the reliability of detecting holographic elements by preventing false detection errors on static color elements of the document.



Fig. 2



Fig. 3

N8637

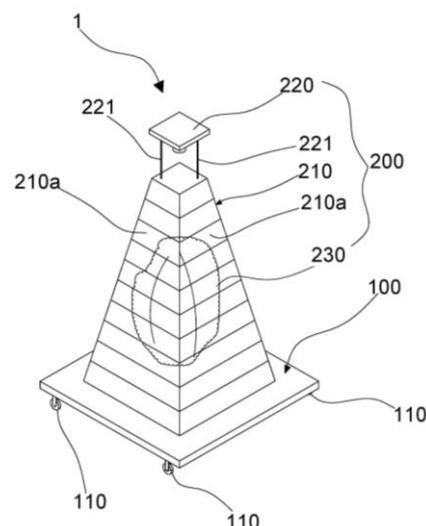
KR20220059223  
Priority Date: 02/11/2020

CLOUDLINE

MOVABLE INTERVERTEBRAL PLATE DEVICE USING HOLOGRAM

The present invention relates to a mobile intervertebral disc device using a hologram, and more particularly, to a mobile intervertebral disc device using a hologram temporarily installed at the back of an event or road and providing various promotional images or phrases to traffic persons in stereoscopic fashion.

**CLAIM 1.** An image display apparatus comprising: a moving table; and a hologram unit formed on an upper portion of the moving table to project an image and display the image in a hologram form, wherein the hologram unit comprises: a multi-planar projection tower structure having a plurality of projection screen surfaces formed on an outer wall thereof; An image projection unit configured to project an image requiring projection onto a projection screen surface of a projection tower structure to display the image in a hologram form on the projection screen surface of the projection tower structure.



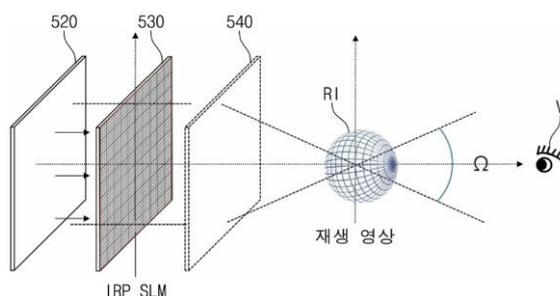
N8638

KR20220056112  
Priority Date: 27/10/2020

KOREA ELECTRONICS & TELECOMMUNICATIONS RESEARCH INSTITUTE

DIGITAL HOLOGRAPHIC DISPLAY DEVICE AND DIGITAL HOLOGRAPHIC IMAGE REPRODUCTION METHOD

A method of reproducing a digital hologram image includes generating and converting a digital hologram having a large numerical aperture (na) corresponding to an amorphous pixel structure spatial light modulator (IRP SLM) having an irregular unit pixel shape or distribution, recording the digital hologram in the amorphous pixel structure spatial light modulator (IRP SLM), Irradiating coherent parallel light to the amorphous pixel structure space light modulator (IRP SLM), removing a noise image of the digital hologram loaded onto the amorphous pixel structure space light modulator (IRP SLM), and implementing a reproduced image reproduced by the amorphous pixel structure space light modulator (IRP SLM).



**CLAIM 1.** A method comprising: generating and transforming a digital hologram having a large numerical aperture (na) corresponding to an amorphous pixel structure spatial light modulator (IRP SLM) having an irregular unit pixel shape or distribution; writing the digital hologram to the amorphous pixel structure spatial light modulator (IRP SLM); Irradiating the amorphous pixel structure space light modulator (IRP SLM) with coherent parallel light; removing a noise image of the digital hologram loaded onto the amorphous pixel structure space light modulator (IRP SLM); and implementing a reproduced image reproduced by the amorphous pixel structure space light modulator (IRP SLM).

N8639

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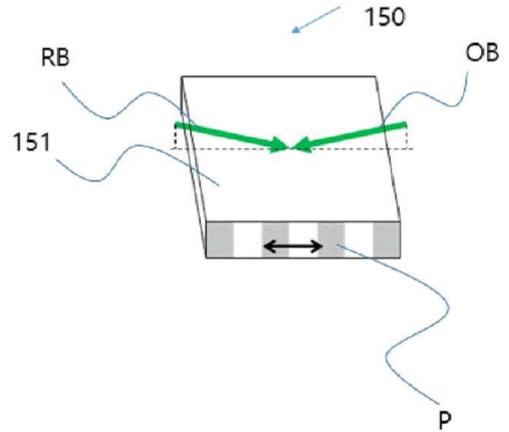
LG CHEM

Priority Date: 14/10/2020

**HOLOGRAPHIC OPTICAL ELEMENT AND HOLOGRAPHIC LIGHT GUIDE PLATE USING THE SAME**

The present invention relates to a holographic optical device and a holographic light guide plate using the same, and more particularly, to a holographic optical device in which a holographic grating pattern capable of diffracting diffracted light having a total reflection angle is formed in a predetermined direction by irradiating light in air, and a holographic light guide plate using the same.

**CLAIM 1.** Reference light irradiated on one surface of the photopolymer resin by forming a first angle with a vertical line of the one surface of the photopolymer resin; and object light irradiated on the one surface of the photopolymer resin by forming a second angle with the vertical line of the one surface of the photopolymer resin; wherein a pattern formed on the photopolymer resin is recorded by the interference phenomenon, wherein a straight line of orthographic reference light projected on one surface of the photopolymer resin and a straight line of orthographic object projected on one surface of the photopolymer resin form a third angle with each other, and wherein high and low refractive portions are alternately arranged in a direction perpendicular to a surface formed by the reference light and the object light.



N8644

EP4002001

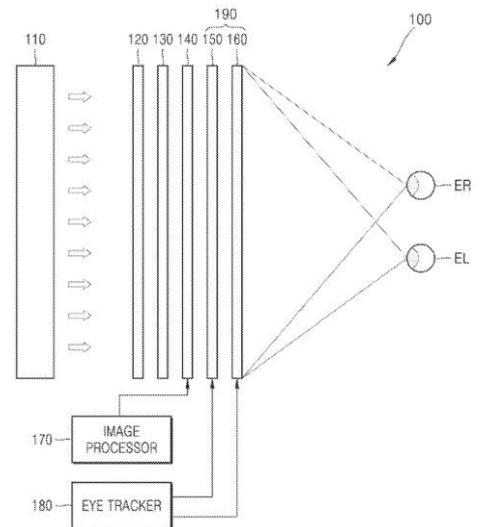
SAMSUNG ELECTRONICS

Priority Date: 23/11/2020

**BEAM DEFLECTION APPARATUS AND HOLOGRAPHIC DISPLAY APPARATUS INCLUDING THE SAME**

A beam deflection apparatus includes a first beam deflector that deflects light in a first direction and a second beam deflector that deflects light in a second direction perpendicular to the first direction, wherein the first beam deflector and the second beam deflector each include a first region for deflecting light of a first wavelength and a second region for deflecting light of a second wavelength, and a ratio of a spatial period of a signal applied to first drive electrodes arranged in the first region of the first beam deflector to the first wavelength is the same as a ratio of a spatial period of a signal applied to second drive electrodes arranged in the second region of the first beam deflector to the second wavelength.

**CLAIM 1.** A beam deflection apparatus comprising: a first beam deflector comprising a first region that deflects light of a first wavelength in a first direction and a second region that deflects light of a second wavelength in the first direction; and a second beam deflector comprising a third region that deflects the light of the first wavelength in a second direction and a fourth region that deflects the light of the second wavelength in the second direction, the second direction being perpendicular to the first direction, wherein the first beam deflector comprises a plurality of first drive electrodes and a plurality of second drive electrodes in the first region and the second region, respectively, and wherein a ratio of a spatial period of a signal applied to the plurality of first drive electrodes to the first wavelength is the same as a ratio of a spatial period of a signal applied to the plurality of second drive electrodes to the second wavelength.



N8645

EP3998501

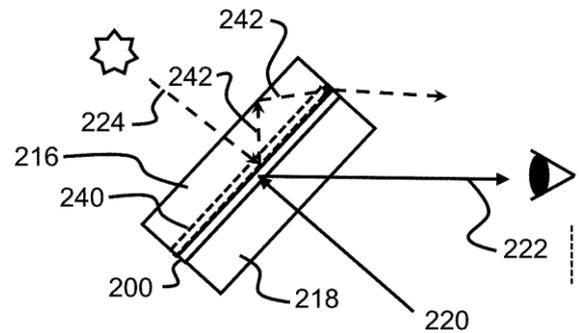
LUMINIT

Priority Date: 27/10/2020

### ELIMINATING GLARE IN HEAD-UP DISPLAYS

Systems and methods for reducing glare from a heads-up display (HUD). Internal and external antireflective coatings may be provided on interior and outer surfaces of glass layers surrounding a holographic polymer layer. A substrate guided hologram may be integrated into a HUD to diffract and direct external radiation to the edge of a HUD. An arrangement for forming a substrate guided hologram includes an array of reflectors and a shaped glass block. Antireflective coated glass layers may be index-matched to opposite sides of a holographic polymer film prior to recording a reflection hologram. An inactive playback beam may be used to monitor the diffraction efficiency of a reflection hologram and of a spurious transmission hologram with the recording of the reflection hologram to maximize the difference between the diffraction efficiencies of useful reflection hologram and spurious transmission hologram.

**CLAIM 1.** A system for reducing glare in a heads-up display (HUD) comprising: (a) a distal glass layer; (b) a proximal glass layer; (c) a holographic polymer layer comprising a reflection hologram that is adjacent to the distal glass layer and the proximal glass layer; and (d) an external antireflective covering an exterior surface of the distal glass layer and the proximal glass layer; wherein radiation from an external light source can diffract on the reflection hologram and pass out of the system without internal reflection off an exterior surface of the distal glass layer; and wherein the radiation from an external light source that does not diffract can pass through an interior surface of the proximal glass layer without Fresnel reflection back onto the reflection hologram thereby eliminating glare.



N8647

CN216596178U

VOLKSWAGEN

Priority Date: 29/10/2021

### HOLOGRAPHIC PROJECTION DEVICE AND VEHICLE

The utility model relates to a holographic projection device and a vehicle. The holographic projection device includes an image processing unit, a projection unit, and an attitude sensor. The image processing unit is respectively connected with the projection unit and the attitude sensor, processes the three-dimensional image and transmits the processed three-dimensional image to the projection unit; the projection unit projects the three-dimensional image into an arc holographic projection interface in a holographic projection mode; a gesture sensor mounted near the user and sensing a user gesture; the image processing unit generates and transmits an updated three-dimensional image to the projection unit in response to the sensed user gesture, and the projection unit projects the updated three-dimensional image in the arc-shaped holographic projection interface. The holographic projection device is convenient for interactive operation, can improve the viewing experience of a user and better meets the sanitary requirements.

**CLAIM 1.** A holographic projection apparatus, characterized by comprising an image processing unit, a projection unit, and an attitude sensor; wherein the image processing unit is respectively connected with the projection unit and the attitude sensor, and the image processing unit is configured to process a three-dimensional image and transmit the processed three-dimensional image to the projection unit; the projection unit is configured to project the three-dimensional image into an arc-shaped holographic projection interface in a holographic projection manner; and the posture sensor is installed at a position near a user viewing the three-dimensional image and configured to sense a posture of the user viewing the three-dimensional image; wherein the image processing unit generates an updated three-dimensional image and transmits the updated three-dimensional image to the projection unit, which projects the updated three-dimensional image in the arc-shaped holographic projection interface, in response to the sensed gesture of the user.

N8648

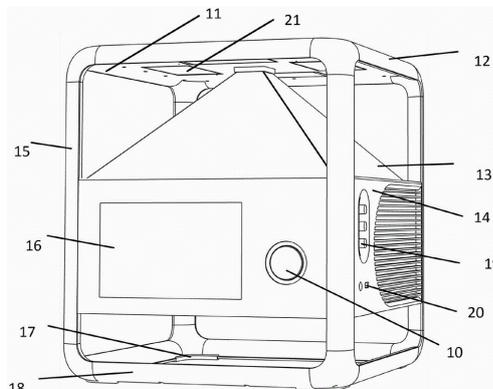
CN216595877U

Priority Date: 27/12/2021

SHENZHEN HORION SOFTWARE

### HOLOGRAPHIC PROJECTION EQUIPMENT AND SYSTEM

The utility model provides a holographic projection equipment and system relates to the holographic projection field. The holographic pyramid holographic display device comprises a device supporting frame, a display screen, a holographic pyramid and a device main body; the equipment support frame is provided with a panel in the horizontal direction, and the display screen is arranged at the bottom of the panel; the holographic pyramid is arranged below the panel; the display screens are distributed around the holographic pyramid, one display screen corresponds to one imaging side face of the holographic pyramid, and the display direction of the display screen is consistent with the direction of the imaging side face corresponding to the display screen in the holographic pyramid; the display screen only needs to acquire the one side corresponding to the image display direction, and need not to acquire the branch picture of other angles, and the design degree of difficulty is lower, and the display effect is better, and simultaneously, the box side increases the touch screen, conveniently controls the projection picture, and the sound structure is suspended in the bottom design, realizes class surround sound effect.



N8649

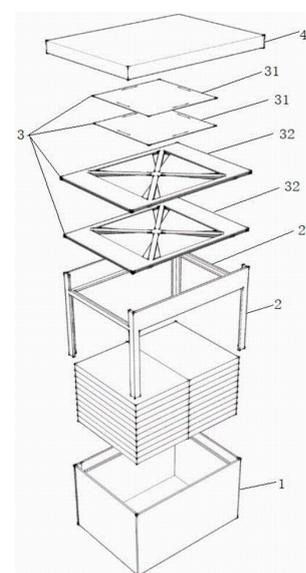
CN216582051U

Priority Date: 23/09/2021

CHINA TOBACCO YUNNAN INDUSTRIAL

### FOLDABLE PYRAMID HOLOGRAPHIC PROJECTION IMAGING BODY, PACKAGING BOX AND CIGARETTE PACKAGING STRIP BOX

The utility model provides a foldable pyramid holographic projection imaging body, a packing box and a cigarette packing strip box, wherein the foldable pyramid holographic projection imaging body comprises: a pyramid imaging member (32) and a bottom fixture (31); the pyramid imaging piece (32) comprises two layers of supporting plates (321) and a layer of holographic projection film (322), wherein the holographic projection film (322) is fixed between the two layers of supporting plates (321); when the foldable pyramid holographic projection imaging body is in a folded state, the pyramid imaging piece (32) and the bottom fixing piece (31) are separately placed in a sheet mode; when the foldable pyramid holographic projection imaging body is in an unfolded state, the foldable pyramid holographic projection imaging body is assisted to the image generation device, and after videos or image pictures played by the image generation device are projected onto the foldable pyramid holographic projection imaging body (3), a 3D image is formed.



**CLAIM 1.** A foldable pyramid holographic projection imaging volume, comprising: a pyramid imaging member (32) and a bottom fixture (31); the pyramid imaging piece (32) comprises two layers of supporting plates (321) and one layer of holographic projection film (322), the middle of each supporting plate (321) is in a cross-shaped framework shape, the holographic projection film (322) is fixed between the two layers of supporting plates (321), four projection surfaces (323) with connected tops are pre-cut on the holographic projection film (322), and the tops of the projection surfaces (323) are fixed at the intersection parts of the cross-shaped frameworks of the supporting plates (321); four pre-cuts (311) are arranged on the bottom fixing piece (31); the bottom of each projection surface (323) is provided with a pin corresponding to the pre-cut (311); when the foldable pyramid holographic projection imaging body is in a folded state, the pyramid imaging piece (32) and the bottom fixing piece (31) are separately placed in a sheet mode; when the foldable pyramid holographic projection imaging body is in an unfolded state, the projection surfaces (323) are pushed out from the hollow parts among the cross-shaped frameworks of the supporting plate (321), pins of the projection surfaces (323) are inserted into the corresponding pre-cuts (311), the bottom of the holographic projection film (322) can be fixed, and two adjacent sides of the four projection surfaces (323) are sequentially connected to form a pyramid shape.

N8650

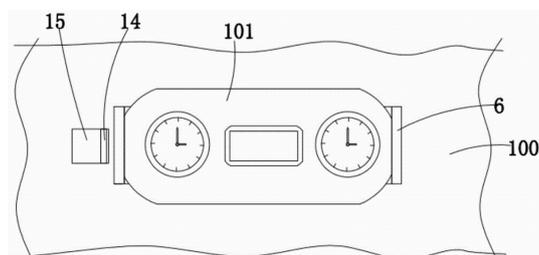
CN216580122U

Priority Date: 10/11/2021

SHANGHAI MENGYUN HOLOGRAPHIC TECHNOLOGY

### HOLOGRAPHIC DISPLAY STRUCTURE OF AUTOMOBILE INSTRUMENT

The utility model discloses a holographic display structure of an automobile instrument, which comprises an automobile instrument holographic display structure body and a mounting seat, wherein a mounting groove is formed in the front side of the mounting seat, the automobile instrument holographic display structure body is positioned in the mounting groove, a push plate is movably contacted with the rear side of the automobile instrument holographic display structure body, four first positioning rods are fixedly connected with the rear side of the push plate, four positioning sleeves are fixedly connected onto the inner wall of the rear side of the mounting groove, the positioning sleeves are slidably sleeved on the corresponding first positioning rods, and a plurality of compression springs in a compression state are fixedly connected between the rear side of the push plate and the inner wall of the rear side of the mounting groove. The automobile instrument holographic display structure body is reasonable in design, can be conveniently and quickly released from shielding the automobile instrument holographic display structure body in a simple pushing mode and can be automatically pushed and popped out, the installation operation of the automobile instrument holographic display structure body can be conveniently and quickly realized after the automobile instrument holographic display structure body is overhauled, a dismantling tool is not needed, the dismantling efficiency is improved, and the use requirement is met.



**CLAIM 1.** Holographic display structure of motormeter, including holographic display structure body (101) of motormeter and mount pad (100), its characterized in that, mounting groove (1) has been seted up to the front side of mount pad (100), holographic display structure body (101) of motormeter is located mounting groove (1), the rear side movable contact of the holographic display structure body of motormeter (101) has push pedal (2), the rear side fixedly connected with four first locating rods (4) of push pedal (2), fixedly connected with four position sleeve pipes (3) on the rear side inner wall of mounting groove (1), position sleeve pipe (3) slip cap is established on corresponding first locating rod (4), fixedly connected with a plurality of compression spring (5) that are in compression state between the rear side of push pedal (2) and the rear side inner wall of mounting groove (1), the front side movable contact of the holographic display structure body of motormeter (101) has two baffles (6), rectangular grooves (7) are respectively formed in the inner walls of two sides of the mounting groove (1), one side, away from each other, of each of the two baffles (6) extends into the corresponding rectangular groove (7), two rectangular pipes (16) are fixedly connected to the inner wall of one side, away from the opening, of each rectangular groove (7), two second positioning rods (8) are respectively and fixedly connected to one side, away from each other, of each baffle (6), each rectangular pipe (16) is slidably sleeved on the corresponding second positioning rod (8), a first spring (9) is fixedly connected between one side, close to the corresponding baffle (6), of each rectangular pipe (16) and each baffle (6), each first spring (9) is movably sleeved on the corresponding second positioning rod (8), two cavities (10) are formed in the mounting seat (100), the mounting groove (1) is located between the two cavities (10), moving rods (11) are fixedly connected to the top and the bottom of each baffle (6), one end, far away from corresponding baffle (6), of each moving rod (11) extends into the cavity (10), a flexible steel rope (12) is fixedly connected to the right side of the moving rod (11) on the left side in the two moving rods (11) in the same cavity (10), a fixed pulley (13) is rotatably mounted between the inner wall of the front side and the inner wall of the rear side of the cavity (10), one end of the flexible steel rope (12) bypasses the right side of the corresponding fixed pulley (13) and is fixedly connected with the right side of the moving rod (11) on the right side, the moving rod (11) on the right side is movably sleeved on the corresponding flexible steel rope (12), a push block (14) is fixedly connected to the front side of the baffle (6) on the left side in the two baffles (6), a through hole (15) is formed in the inner wall of the front side of the rectangular groove (7) on the left side in the two rectangular grooves (7), and the front side of the push block (14) penetrates through the through hole (15) and extends to the front side of the mounting seat (100).

N8651

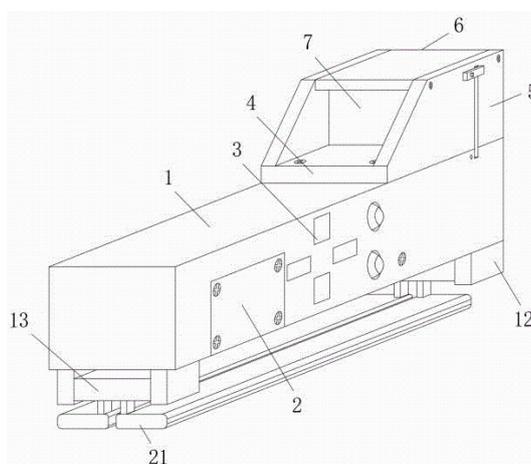
CN216558521U

Priority Date: 23/12/2021

NANTONG TENGFENG OPTICAL INSTRUMENT

### INTELLIGENT HOLOGRAPHIC SIGHTING TELESCOPE

The utility model relates to the technical field of sighting telescope, in particular to an intelligent holographic sighting telescope which comprises a main shell, wherein a battery assembly is fixedly arranged at the bottom end inside the main shell, a control key assembly is fixedly arranged on the side surface of the main shell on one side of the battery assembly, a bottom plate is fixedly arranged at one end of the top of the main shell through a bolt, side plates are fixedly arranged on two sides of the top of the bottom plate, a top plate is fixedly arranged at the tops of the side plates, a sighting lens is fixedly arranged at the top of the bottom plate, an sunglass lens is slidably arranged at the top of the bottom plate on one side of the sighting lens, and a sliding block is fixedly connected to the upper end of one side of the sunglass lens. According to the utility model, the bottom of the sighting telescope is fixedly provided with the adjusting mechanism, the adjusting block and other structures, so that the sighting telescope is convenient to install when in actual use, the installation mechanism of the sighting telescope can be adjusted, the sighting telescope is convenient to install on various guns, the sighting telescope is suitable for various guns, strong light stimulation to eyes of a user can be effectively reduced, and the sighting precision is increased.



**CLAIM 1.** The utility model provides an intelligent holographic sighting telescope, a serial communication port, including main casing body (1), the inside bottom fixed mounting of main casing body (1) has battery pack (2), the main casing body (1) side fixed mounting of battery pack (2) one side has control button subassembly (3), the one end at main casing body (1) top has bottom plate (4) through bolt fixed mounting, the both sides fixed mounting at bottom plate (4) top has curb plate (5), the top fixed mounting of curb plate (5) has roof (6), the top fixed mounting of bottom plate (4) has sighting lens (7), bottom plate (4) top slidable mounting of sighting lens (7) one side has sunglasses piece (8), the upper end fixed connection of sunglasses piece (8) one side has slider (9), the both ends fixed mounting of main casing body (1) bottom has installation piece (12), all fixed mounting has between installation piece (12) adjusts casing (13), mounting groove (14) have been set up to the inside of adjusting casing (13), and gear assembly (15) are installed in the inside intermediate position department rotation of mounting groove (14), and the upper and lower both sides of gear assembly (15) mesh respectively toothed plate one (18) and toothed plate two (19), and the bottom of toothed plate one (18) and toothed plate two (19) all fixedly connected with driving plate (20), and the bottom of driving plate (20) all fixedly mounted has regulating block (21).

N8652

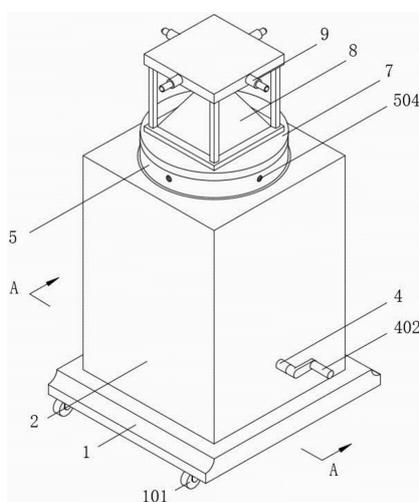
CN216556302U

Priority Date: 01/09/2021

STATE GRID CORPORATION OF CHINA

### HOLOGRAPHIC 3D DISPLAY DEVICE

The utility model discloses a holographic 3D display device which comprises a base, a cabinet body, a mounting seat, a rotating shaft, a rotating rod, a lifting seat, a rotating disc, a 3D holographic projector and a mounting column, wherein a square cavity is arranged in the cabinet body, the mounting seat is fixed in the middle of the inner bottom surface of the cabinet body, the rotating shaft is vertically mounted on the upper end surface of the mounting seat, a first gear is constructed at the bottom of the rotating shaft, a second gear is meshed and matched with one side of the first gear, the rotating rod is connected with the rotating rod, one end of the rotating rod, far away from the second gear, horizontally penetrates out of the cabinet body and is constructed with a handle, a partition plate is further horizontally constructed at the inner bottom of the cabinet body, the top end of the rotating shaft penetrates through the partition plate and is matched with an abutting column, and a threaded hole for inserting a rotating shaft thread is formed in the bottom end of the abutting column. This holographic 3D display device, the convenience is protected 3D holographic projector when the transportation, and can rotate 3D holographic projector, has improved the bandwagon effect, convenient to use.



**CLAIM 1.** The utility model provides a holographic 3D display device, includes base (1), the cabinet body (2) and 3D holographic projector (8), its characterized in that: a square cavity is arranged in the cabinet body (2), a mounting seat (3) is fixed in the middle of the bottom surface in the cabinet body (2), a rotating shaft (301) is vertically installed on the upper end surface of the mounting seat (3), a first gear (302) is constructed at the bottom of the rotating shaft (301), a second gear (401) is meshed and matched with one side of the first gear (302), a rotating rod (4) is connected with the second gear (401), one end of the rotating rod (4) far away from the second gear (401) horizontally penetrates out of the cabinet body (2) and is constructed with a handle (402), a clapboard (201) is horizontally arranged at the bottom in the cabinet body (2), the top end of the rotating shaft (301) penetrates through the clapboard (201) and is matched with a butt-joint column (502), the bottom end of the butt-joint column (502) is provided with a threaded hole for the threaded insertion of the rotating shaft (301), the top end of the butt-joint column (502) is supported with a lifting seat (5), and the upper end surface of the lifting seat (5) extends out of the upper end surface of the cabinet body (2).

N8653

CN216526752U

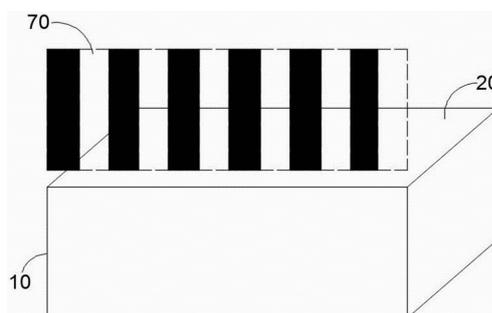
Priority Date: 31/05/2021

FUTURUS TECHNOLOGY

### HOLOGRAPHIC KEYBOARD, HOLOGRAPHIC FOUNTAIN AND HOLOGRAPHIC FIREWORK

The present disclosure provides a holographic keyboard, a holographic fountain and a holographic firework, wherein the holographic keyboard comprises; the method comprises the following steps: a housing; a display component; and a controller, a collector and a player; the display component is configured to emit imaging light rays of imaging contents at least including keys, so that the imaging light rays are emitted to an area far away from the shell through the light outlet and form a real image; the input end of the controller is connected with the output end of the collector, and the output end of the controller is connected with the input end of the display component and the input end of the player; the collector is configured to collect the area information of the touched real image, the controller is configured to control the display assembly to emit imaging light rays of which the imaging contents at least comprise changed keys matched with the area information based on the area information, and the controller is further configured to control the player to play audio matched with the area information. The method can solve the problems of poor imaging effect and insufficient definition of the traditional holographic device.

**CLAIM 1.** A holographic keyboard, comprising: a housing having a light outlet; a display assembly disposed within the housing; and a controller, a collector and a player; the display component is configured to emit imaging light rays of imaging contents at least including keys, so that the imaging light rays are emitted to an area far away from the shell through the light outlet and form a real image; the input end of the controller is connected with the output end of the collector, and the output end of the controller is connected with the input end of the display component and the input end of the player; the collector is configured to collect area information of the touched real image, the controller is configured to control the display assembly to emit imaging contents including at least imaging light of changed keys matched with the area information based on the area information, and the controller is further configured to control the player to play audio matched with the area information.



N8654

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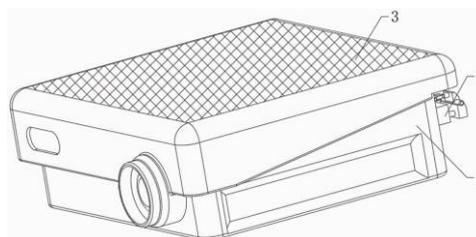
Priority Date: 28/10/2021

XI AN YONGMING INFORMATION TECHNOLOGY

### INTELLIGENT THREE-DIMENSIONAL HOLOGRAPHIC PROJECTION EQUIPMENT

The utility model provides intelligent three-dimensional holographic projection equipment, which relates to the technical field of holographic projection and comprises an equipment body, wherein a sliding groove is formed in the rear surface of the equipment body, an ash removal structure is connected to the inner surface of the sliding groove in a sliding mode, the ash removal structure comprises a sliding block connected with the inner surface of the sliding groove in a sliding mode, a pull block is connected to the rear surface of the sliding block, and a bearing frame is connected to the top surface of the sliding block. According to the dust cleaning device, when dust cleaning is required to be carried out on the outer surface of the device body, the rotating shaft is rotated firstly, then the rotating shaft drives the rotating block to displace, the rotating block drives the first electric telescopic rod to carry out angle adjustment, after the angle adjustment with the first electric telescopic rod is finished, the first electric telescopic rod can be opened, then the output end of the first electric telescopic rod drives the connecting block to displace, and through the dust cleaning structure, the problem of dust cleaning is solved as much as possible, and the problem that dust enters the device body to cause aging of parts is reasonably avoided.

**CLAIM 1.** The utility model provides an intelligence three-dimensional holographic projection equipment, includes equipment body (1), its characterized in that: the rear surface of equipment body (1) has seted up the spout, and the internal surface sliding connection of spout has deashing structure (2), deashing structure (2) include with spout internal surface sliding connection's slider (201), the rear surface of slider (201) is connected with draws piece (202), the top surface of slider (201) is connected with accepting frame (203), the internal surface swivelling joint of accepting frame (203) has pivot (204), the surface of pivot (204) is connected with rotatory piece (205), the surface of rotatory piece (205) is connected with first electric telescopic handle (206), the one end that rotatory piece (205) surface was kept away from in first electric telescopic handle (206) is connected with connecting block (207).



N8655

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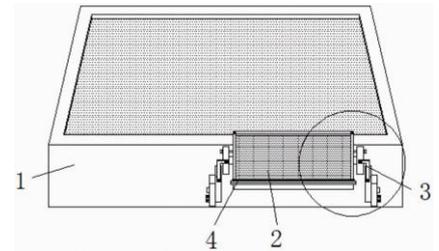
Priority Date: 25/11/2021

SHANGHAI JIANKE ARCH DESIGN INSTITUTE

**HOLOGRAPHIC ANALOGUE MEANS FOR ARCHITECTURAL DESIGN**

The utility model discloses a holographic simulation device for architectural design, which comprises a digital sand table, an operation panel and adjusting components, wherein the operation panel is arranged on the front surface of the digital sand table through two adjusting components, each adjusting component comprises a support frame, a circular plate, an installation shaft, a vertical frame and a limiting rod, one end of an L-shaped support frame is fixed on the front surface of the digital sand table through a screw, the other end of the support frame extends to the outer side of the operation panel, the circular plate is vertically positioned on the outer side of the operation panel, the installation shaft and the limiting rod are arranged between the circular plate and the operation panel, and the L-shaped vertical frames are fixed on the front surface and the rear surface of the upper end of the support frame through screws; according to the utility model, the adjusting assembly is arranged, so that the operation and use of the operation panel are not influenced, the use height and angle of the operation panel can be adjusted according to the requirements of users, the use convenience of the operation panel is increased, and the probability of light reflection or uncomfortable watching of the operation panel due to improper angle can be reduced.

**CLAIM 1.** A holographic simulation device for architectural design, includes digital sand table (1), operating panel (2) and adjusting part (3), its characterized in that: operating panel (2) are installed at digital sand table (1) front surface through two adjusting part (3), adjusting part (3) are including support frame (31), plectane (32), installation axle (33), grudging post (34) and gag lever post (35), the L type support frame (31) one end is passed through the fix with screw at digital sand table (1) front surface, support frame (31) other end extends to operating panel (2) outside, plectane (32) are vertical to be located operating panel (2) outside, and is provided with installation axle (33) and gag lever post (35) between the two, support frame (31) upper end front and back surface all is fixed with grudging post (34) of L type through the screw, two grudging post (34) other end passes through the screw and fixes surface around plectane (32) respectively.



N8656

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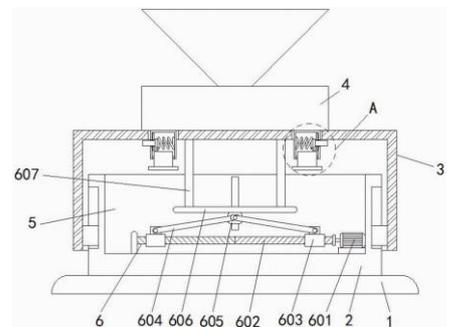
Priority Date: 05/01/2022

SHENZHEN SHANSHUI ORIGINAL CARTOON CULTURE

**360-DEGREE HOLOGRAPHIC PROJECTION DEVICE**

The utility model relates to a holographic projection technical field specifically is a 360 degree holographic projection arrangement, the on-line screen storage device comprises a base, the top fixedly connected with connecting block of base, the surface swing joint of connecting block has the movable box, the holographic projection equipment of top fixedly connected with of movable box, the spread groove has been seted up at the top of connecting block, the inside of spread groove is provided with adjusting part, holographic projection equipment's bottom is provided with fixed subassembly, adjusting part including with spread groove inner wall fixed connection's motor. This 360 degrees holographic projection arrangement drives the threaded rod through the motor and rotates, because set up the screw thread of two symmetries on the threaded rod, threaded rod and screwed pipe threaded connection can make two screwed pipes remove relatively or from each other to drive the movable block through the movable rod and reciprocate, remove with the movable box that the promotion connecting rod is connected, and then play the effect of regulation.

**CLAIM 1.** The 360-degree holographic projection device comprises a base (1) and is characterized in that: the top of the base (1) is fixedly connected with a connecting block (2), the outer surface of the connecting block (2) is movably connected with a movable box (3), the top of the movable box (3) is fixedly connected with holographic projection equipment (4), the top of the connecting block (2) is provided with a connecting groove (5), an adjusting component (6) is arranged inside the connecting groove (5), and the bottom of the holographic projection equipment (4) is provided with a fixing component (7); adjusting part (6) including with spread groove (5) inner wall fixed connection's motor (601), the output shaft fixedly connected with threaded rod (602) of motor (601), the surface threaded connection of threaded rod (602) has screwed pipe (603) that quantity is two, two the equal swing joint in top of screwed pipe (603) has movable rod (604), two the one end swing joint that screwed pipe (603) were kept away from in movable rod (604) has movable block (605), the top fixedly connected with connecting plate (606) of movable block (605), the top fixedly connected with connecting rod (607) of connecting plate (606), the top of connecting rod (607) and the inner wall fixed connection of movable box (3).



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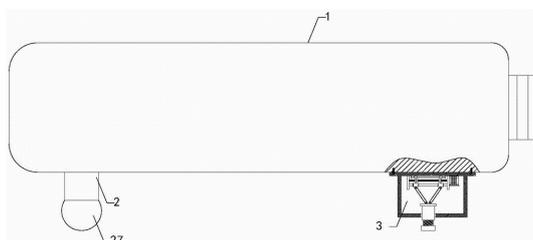
CN216480080U

Priority Date: 19/11/2021

INNER MONGOLIA MAISUI CULTURE MEDIA

### BE APPLIED TO INDOOR HOLOGRAPHIC PROJECTION DISPLAY DEVICE

The utility model relates to the technical field of holographic projection, in particular to a holographic projection display device applied indoors, which can improve the automation degree and flexibility through setting; the novel support structure comprises a body, two sets of left supporting legs and two sets of right bearing structure, body bottom and two sets of left supporting leg top fixed connection, two sets of right bearing structure tops and body bottom are connected, wherein every group right bearing structure still includes the support box, two sets of connecting plates, first lead screw, the second lead screw, including a motor, an end cap, a controller, and a cover plate, two sets of lead screw bolts, two sets of slides, the slide bar, two sets of first sliding sleeves, two sets of first articulated seats, two sets of connecting rods, the fixed plate, two sets of articulated seats of second and supporting shoe, support the box top and install in the body bottom, be equipped with the cavity in the support box, connecting plate top and support box top fixed connection, the screw thread opposite direction of first lead screw and second lead screw, first lead screw and second lead screw fixed connection, and the other end of first lead screw and second lead screw rotates with the connecting plate respectively and is connected.



**CLAIM 1.** A holographic projection display device applied to the indoor is characterized by comprising a body (1), two groups of left supporting legs (2) and two groups of right supporting structures (3), wherein the bottom end of the body (1) is fixedly connected with the top ends of the two groups of left supporting legs (2), the top ends of the two groups of right supporting structures (3) are connected with the bottom end of the body (1), each group of right supporting structures (3) further comprises a supporting box (4), two groups of connecting plates (5), a first lead screw (6), a second lead screw (7), a motor (8), two groups of lead screw bolts (9), two groups of sliding plates (10), a sliding rod (11), two groups of first sliding sleeves (12), two groups of first hinging seats (13), two groups of connecting rods (14), a fixing plate (15), two groups of second hinging seats (16) and a supporting block (18), the top end of the supporting box (4) is installed at the bottom end of the body (1), a cavity is arranged in the supporting box (4), the top end of a connecting plate (5) is fixedly connected with the top end of a supporting box (4), the thread directions of a first lead screw (6) and a second lead screw (7) are opposite, the first lead screw (6) is fixedly connected with the second lead screw (7), the other ends of the first lead screw (6) and the second lead screw (7) are respectively rotatably connected with the connecting plate (5), the right end of the second lead screw (7) penetrates through the connecting plate (5) on the right side and is connected with the output end of a motor (8), the top end of the motor (8) is fixedly connected with the bottom end of the supporting box (4), two groups of lead screw bolts (9) are respectively screwed on the first lead screw (6) and the second lead screw (7), the lead screw bolts (9) are fixedly connected with a sliding plate (10), two groups of sliding plates (10) respectively penetrate through the first lead screw (6) and the second lead screw (7), a sliding rod (11) is fixedly installed between the two groups of connecting plates (5), a first sliding sleeve (12) is slidably connected with the sliding rod (11), slide (10) bottom and first sliding sleeve (12) top fixed connection, first sliding sleeve (12) bottom and first articulated seat (13) top fixed connection, connecting rod (14) top and first articulated seat (13) bottom are articulated, connecting rod (14) bottom and the articulated seat (16) top of second are articulated, the articulated seat (16) fixed mounting of second is on fixed plate (15) top, it is equipped with through-hole (17) to support box (4) bottom, through-hole (17) are passed in supporting shoe (18), supporting shoe (18) top and fixed plate (15) bottom fixed connection.

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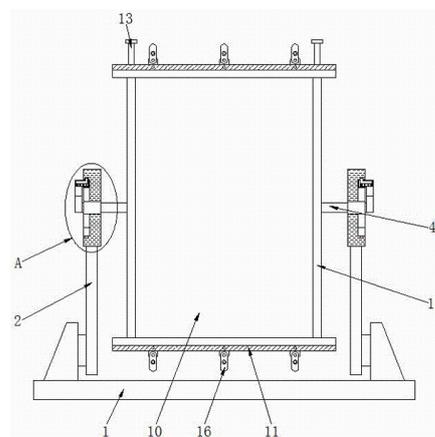
Priority Date: 29/12/2021

SOOCHOW UNIVERSITY

### DISMANTLE CONVENIENT CONNECTION STRUCTURE FOR HOLOGRAPHIC WAVEGUIDE LENS

The utility model discloses a dismantle convenient connection structure for holographic waveguide lens, comprising a base plate, ground, holographic waveguide lens body are directly arranged in to the bottom plate, the upper and lower both ends of holographic waveguide lens body all are provided with solid fixed splint, stop gear is used for spacing between carrying on between spliced pole and the connecting plate, the mounting panel, be connected through the pivoted mode between mounting panel and the solid fixed splint, and the mounting panel laminating sets up the front side at both ends about holographic waveguide lens body. This dismantle convenient connection structure for holographic waveguide lens can be very quick convenient installs holographic waveguide lens body, and convenient simultaneously is dismantling it after the use, simple structure, convenient to use, in addition, in the use, through the setting of connecting post, can drive holographic waveguide lens body and overturn in the top of bottom plate to can adjust the use angle of holographic waveguide lens body.

**CLAIM 1.** A connecting structure for a conveniently-disassembled holographic waveguide lens comprises a base plate (1), wherein the base plate (1) is directly arranged on the ground, and the left side and the right side of the upper end of the base plate (1) are fixedly connected with fixing plates (2) which are in a vertical state and have a supporting effect; the holographic waveguide lens comprises a holographic waveguide lens body (10), wherein fixing clamping plates (11) are arranged at the upper end and the lower end of the holographic waveguide lens body (10); it is characterized by also comprising: the limiting mechanism (5) is used for limiting the space between the connecting column (4) and the connecting plate (3), the connecting column (4) is fixedly connected with the supporting rod (14), and the connecting column (4) drives the holographic waveguide lens body (10) to form a turnover structure above the bottom plate (1) through the supporting rod (14) and the fixing clamp plate (11); mounting panel (16), be connected through the pivoted mode between mounting panel (16) and solid fixed splint (11), and mounting panel (16) laminating sets up the front side at both ends about holographic waveguide lens body (10) to mounting panel (16) drive holographic waveguide lens body (10) constitute on solid fixed splint (11) and dismantle the structure.



N8659

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Priority Date: 25/08/2021

HANGZHOU COOLA CULTURE DEVELOPMENT

### STAGE HOLOGRAPHIC DISPLAY SYSTEM CAPABLE OF AUTOMATICALLY ADJUSTING BRIGHTNESS AND ENHANCING SUBSTITUTED FEELING

The utility model discloses a stage holographic display system capable of automatically adjusting brightness and enhancing substitution feeling, which comprises a holographic 3D projection device, an image acquisition card, an image transmission unit, a light power adjusting unit and a central processing unit, the output end of the image acquisition card is connected with the input end of the image transmission unit, the output end of the image transmission unit is connected with the central processing unit, the central processing unit is connected with the input end of the holographic 3D projection equipment, and the output end of the holographic 3D projection equipment is connected with the holographic projection screen; in addition, the brightness of the stage light can be freely adjusted, and the substitution feeling is enhanced.

**CLAIM 1.** The utility model provides a holographic display system of stage of sense is substituted in automatic regulation brightness reinforcing, includes holographic 3D projection equipment (1), image acquisition card (2), image transmission unit (3), light power regulating unit (8) and central processing unit (4), its characterized in that: the output end of the image acquisition card (2) is connected with the input end of the image transmission unit (3), the output end of the image transmission unit (3) is connected with the central processing unit (4), the central processing unit (4) is connected with the input end of the holographic 3D projection device (1), the output end of the holographic 3D projection device (1) is connected with the holographic projection screen (5), the holographic 3D projection device further comprises a storage module (7), and the storage module (7) is connected with the central processing unit (4); the central processor is connected with stage lighting (9) through a lighting power adjusting unit (8).

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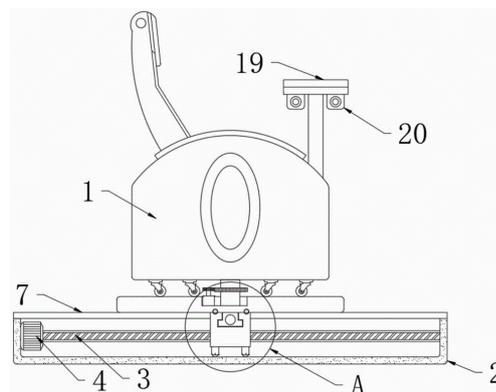
Priority Date: 24/09/2021

QINGDAO HUWEI TECHNOLOGY

### 3D HOLOGRAPHIC SOMATOSENSORY INTERACTION SYSTEM

The utility model discloses a 3D holographic somatosensory interaction system which comprises an installation frame and a customized seat arranged on the installation frame, wherein an operation box is arranged on the customized seat, two playing modules are arranged at the lower end of the operation box, a moving seat is connected in the installation frame in a sliding mode, a first driving mechanism used for driving the moving seat to move left and right is arranged in the installation frame, the first driving mechanism comprises a first motor fixedly connected to the inner wall of the installation frame, and an output shaft of the first motor is fixedly connected with a first threaded rod. The mobile seat is arranged, the left and right movement of the customized seat can be completed, so that the watching position can be adjusted, the watching feeling of a user is improved, the sliding plate is arranged, the left and right movement of the customized seat can be completed, the watching feeling of the user is improved, in addition, the rotating column is arranged, the angle adjustment of the customized seat can be completed, and the watching feeling of the user is further improved.

**CLAIM 1.** The utility model provides an interactive system is felt to 3D hologry body, includes installing frame (2) and customization seat (1) of setting on installing frame (2), its characterized in that, install operation box (19) on customization seat (1), two play module (20) are installed to operation box (19) lower extreme, sliding connection has removal seat (6) in installing frame (2), be equipped with in installing frame (2) and be used for the drive to remove first actuating mechanism that removes seat (6) and remove, first actuating mechanism includes first motor (4) of fixed connection at installing frame (2) inner wall, the output shaft fixedly connected with first threaded rod (3) of first motor (4), the one end that first motor (4) were kept away from in first threaded rod (3) runs through and removes seat (6) lateral wall, first threaded rod (3) with remove seat (6) threaded connection, and a second driving mechanism for driving the customized seat (1) to rotate and move is arranged on the mounting frame (2).



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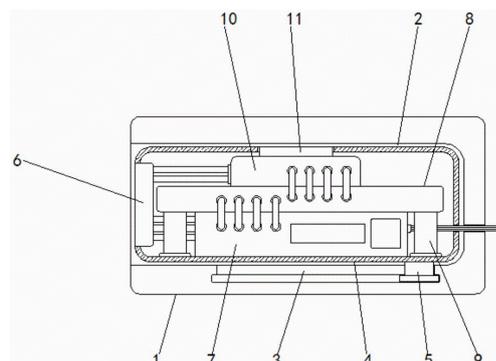
Priority Date: 14/11/2021

BEIJING LUCHENG JINXIU ENERGY TECHNOLOGY

### HOLOGRAPHIC AERIAL INTELLIGENT DISPLAY SYSTEM OF MOBILE CARRIER

The utility model relates to a holographic aerial intelligent display system of a mobile carrier, which comprises an installing machine box, wherein a control assembly is arranged in the installing machine box, a prism entertainment AID-holographic aerial intelligent display system is integrated in the control assembly, the control assembly comprises a carrying shell movably arranged in the installing machine box, a processor is fixedly arranged on the inner bottom wall of the carrying shell, an installing frame is fixedly arranged at the top of the processor, a holographic projector is fixedly arranged in the installing frame, and a projection lens is fixedly arranged at the top of the holographic projector. This remove aerial intelligent display system of holographically of carrier, the passenger only need press the button on the switch keyboard, just can automatic start electron slider make and carry on the automatic roll-off of shell, can use through the operation screen, throws out 3D stereoscopic image in the midair through holographic projecting apparatus to this reaches the tired taste of alleviating the long-distance car of sitting by bus.

**CLAIM 1.** The utility model provides a remove aerial intelligent display system of holography of carrier, includes installation machine box (1), its characterized in that: the mounting machine box (1) is internally provided with a control assembly, and a prism optical entertainment AID-holographic aerial intelligent display system is integrated in the control assembly; the prism optical entertainment AID-holographic aerial intelligent display system comprises a peripheral access module, an input module and a switch module, wherein the input module is in data connection with a control module, and a network receiving module, a display module and an electric quantity detection module are integrated in the control module.



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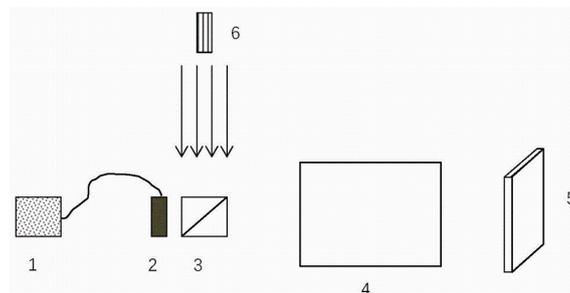
CN114488523

Priority Date: 28/01/2022

SOUTHEAST UNIVERSITY

### OPTICAL DISPLAY SYSTEM AND METHOD FOR EXPANDING HOLOGRAPHIC DISPLAY EYE BOX AND FIELD ANGLE

The invention relates to an optical display system and a method for expanding holographic display eye box and field angle, wherein a holographic image generated by a holographic image generating unit as coherent light in the system is subjected to image filtering and zooming from a beam splitter prism to a relay optical system, and is subjected to multiple reflection and diffraction in propagation through a waveguide structure; the method comprises the following steps: loading the hologram corresponding to the reconstruction result by calculation to a hologram generation unit, setting a coherent light source or an incoherent light source with a preset wavelength, and transmitting the coherent light source or the incoherent light source through a relay optical system corresponding to the selected hologram calculation method; the propagated light wave is coupled into the waveguide system and the result of the hologram, in which both the eye box and the field angle have been enlarged, is observed at the coupling-out portion. The invention effectively improves the eyebox and the field angle of the hologram reconstruction result, enlarges the observable range of the hologram reconstruction result and improves the quality and experience of observing the hologram in free space.



**CLAIM 1.** An optical display system for expanding the holographic display eye box and the field angle is characterized by comprising a computer (1), a hologram generating unit (2), a beam splitter prism (3), a relay optical system (4), a waveguide structure (5) and a light shadow (6), wherein the hologram generating unit (2) controlled by the computer (1) generates a hologram for coherent light, the hologram passes through the beam splitter prism (3) to the relay optical system (4), the relay optical system (4) performs image filtering and zooming on the hologram, and the hologram generates multiple reflections and diffractions in the transmission process through the waveguide structure (5), and the reflections and diffractions do not generate interference with the hologram.

N8672

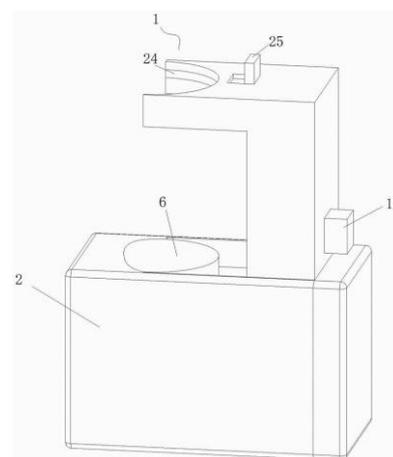
CN114446205

Priority Date: 26/02/2022

MA KAINENG | XU LIANJUN

### HOLOGRAPHIC PROJECTOR

The invention relates to the technical field of holographic projection, in particular to a holographic projector, which comprises a projector body; an object placing plate is arranged in the projector body; the storage plate is provided with a glass cover; a projection source is arranged at the top of the glass cover; a shell is arranged in the projector body; the shell is provided with a switch; a protective cover is arranged outside the projection source; a dust removal device and a dust removal device are arranged in the shell; the dust removal device is matched with the driving device, dust on the object placing plate, the glass cover and the protective cover is removed by the dust removal device before use, and the object placing plate, the glass cover and the protective cover enter the shell through the driving device after use, so that the glass cover, the projection source and the protective cover are protected on one hand; on the other hand, the possibility that the glass cover and the protective cover are polluted by dust is reduced, so that the dust removal efficiency is improved, and the clarity and reality of the holographic image are further improved.



**CLAIM 1.** A holographic projector comprising a projector body (1); an object placing plate (3) is arranged in the projector body (1); the storage plate (3) is provided with a glass cover (4); a projection source (5) is arranged at the top of the glass cover (4); the method is characterized in that: a shell (2) is arranged in the projector body (1); a protective cover (6) is arranged outside the projection source (5); also includes; a drive device; the driving device is arranged in the shell (2) and used for driving the object placing plate (3), the glass cover (4), the projection source (5) and the protective cover (6) to ascend and descend; a dust removal device; the dust removal device is arranged in the shell (2) and used for removing dust on the glass cover (4).

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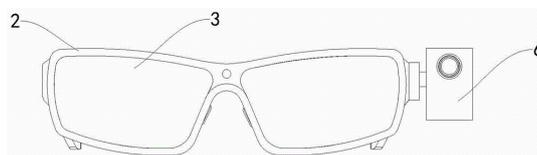
Priority Date: 10/02/2022

ZAIXIU NETWORK TECHNOLOGY SHENZHEN

### 3D HOLOGRAPHIC HEAD-WEARING INTELLIGENT COMMUNICATION GLASSES EQUIPMENT AND CONTROL METHOD

The invention provides 3D holographic head-wearing intelligent communication glasses equipment and a control method, and relates to the field of intelligent glasses. The intelligent communication glasses comprise a glasses body, a microprocessor, a power supply module, an audio and video interaction communication module, a wireless network module, a communication module, a camera module, a face sensor, a body recognition sensor and a 3D holographic projection module; the 3D holographic projection module includes an image capturing unit, an image processing unit, and an image projection unit. The control method of the conversation glasses at least comprises the following steps: s1, the voice interaction module actively activates the communication module to carry out a conversation function; s2, pressing the start button to excite the 3D holographic projection module, transmitting the scene image information acquired by the satellite positioning module to the image processing unit and transmitting the scene image information to the user, and receiving the image transmitted by the user and the user by the image processing unit and emitting the image from the image projection unit to form the holographic projection of the user. The invention has the function of correcting eyesight, and the functions of voice communication and holographic projection.

**CLAIM 1.** A 3D holographic head-wearing intelligent communication glasses device is characterized by comprising a glasses main body, a microprocessor, a power supply module, a communication module, an audio and video interactive communication module, a camera module, a face sensor, a body recognition sensor and a 3D holographic projection module; the glasses main body comprises a glasses frame, glasses legs arranged on the glasses frame and a glasses display; the microprocessor, the 3D holographic projection module, the power supply module, the audio and video interactive communication module and the communication module are all arranged on the glasses body, and the microprocessor is simultaneously electrically connected with the 3D holographic projection module, the audio and video interactive communication module and the communication module; the 3D holographic projection module comprises an image capturing unit, an image processing unit and an image projection unit, wherein the glasses body is provided with a starting key used for actively exciting the 3D holographic projection module to work, the image capturing unit is used for collecting external image information and transmitting the external image information to a user, the image processing unit receives the image information of the user, and the image processing unit processes an image and projects the image through the image projection unit; the power module is simultaneously and electrically connected with the microprocessor, the communication module, the audio and video interactive communication module and the 3D holographic projection module, and the power module is used for supplying power to the microprocessor, the communication module and the 3D holographic projection module.



N8673

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Priority Date: 15/03/2022

SHENZHEN BBAI INFORMATION TECHNOLOGY

### 3D HOLOGRAPHIC IMAGE INTERACTION METHOD, DEVICE, SYSTEM AND MEDIUM

The invention discloses a 3D holographic image interaction method, a device, a system and a medium, wherein the method comprises the following steps: when a projection instruction is received, determining a 3D model according to the projection instruction through a DaaS artificial intelligence data twin platform, and projecting the 3D model through projection equipment to obtain a 3D holographic image; acquiring interactive information, determining corresponding reply information according to the interactive information, and displaying the reply information through the 3D holographic image; according to the method and the device, the 3D model is determined, the 3D model is projected through the projection equipment to obtain the 3D holographic image, the interaction information is obtained, the corresponding reply information is determined according to the interaction information, and the reply information is displayed through the 3D holographic image, so that the intelligence of the 3D holographic image is improved, and the 3D holographic image can interact with a user.

**CLAIM 1.** A 3D holographic image interaction method is characterized by comprising the following steps: when a projection instruction is received, determining a 3D model according to the projection instruction through a DaaS artificial intelligence data twin platform, and projecting the 3D model through projection equipment to obtain a 3D holographic image; and acquiring interactive information, determining corresponding reply information according to the interactive information, and displaying the reply information through the 3D holographic image.

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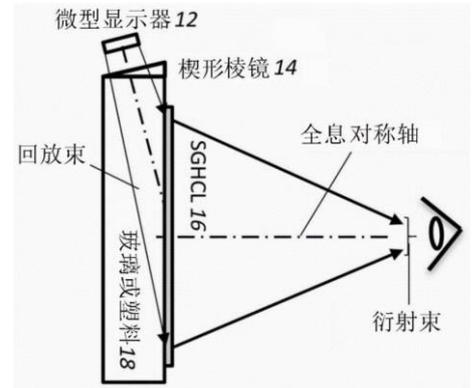
LUMINIT

Priority Date: 06/11/2020

**HEAD-MOUNTED PERSPECTIVE DISPLAY AND RECORDING SYSTEM GUIDED BY HOLOGRAPHIC SUBSTRATE AND INTELLIGENT GLASSES**

Holographic substrate guided head mounted see-through displays and recording systems and smart glasses are described. The present application relates to a head mounted see-through display using a recorded substrate guided holographic sequential lens (SGHCL) and a scanning laser beam to produce an image on a diffuser or a micro display with laser illumination. The high diffraction efficiency of the volume SGHCL produces very high brightness of the virtual image.

**CLAIM 1.** A holographic substrate guided see-through head mounted display comprising: (a) an image source comprising a scanning laser beam or a microdisplay with laser illumination; (b) an edge-illuminated transparent substrate; (c) a single volume substrate guided holographic continuous lens; and (d) a diffuser; wherein the scanning laser beam produces an image on the diffuser, and wherein, upon playback, the incident guided beam undergoes total internal reflection and strikes the substrate-guided holographic continuous lens under Bragg conditions.



N8675

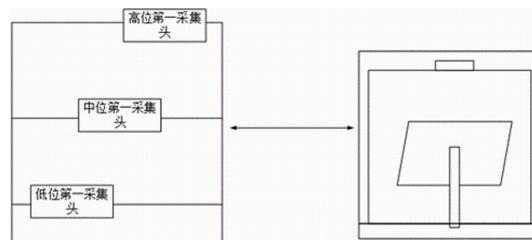
CN114430482

SHENZHEN JIDA HEALTH MEDICAL TECHNOLOGY

Priority Date: 02/04/2022

**HOLOGRAPHIC DIAGNOSIS SYSTEM, METHOD, COMPUTER EQUIPMENT AND STORAGE MEDIUM**

The invention relates to the technical field of Internet of things, in particular to a holographic diagnosis system, a holographic diagnosis method, computer equipment and a storage medium, wherein the holographic diagnosis system comprises an acquisition terminal and a display terminal which are communicated with each other, the acquisition terminal is used for acquiring display information of an object and transmitting the display information to the display terminal, and the display terminal is used for displaying the display information; the acquisition terminal specifically comprises a holographic acquisition device and an image acquisition device, the holographic acquisition device acquires three-dimensional information of an object in real time, and the image acquisition device acquires local image information of the object according to user control; the display terminal comprises a holographic projection device and a plane display device which are integrally arranged, the holographic projection device displays a holographic image of an object in real time, and the plane display device displays acquired local image information on the three-dimensional stereo image in an overlapping mode. The invention displays three-dimensional information and plane images by superposition, combines the whole and the local and is convenient for remote diagnosis.



**CLAIM 1.** The holographic diagnosis system is characterized by comprising an acquisition terminal and a display terminal which are communicated with each other, wherein the acquisition terminal is used for acquiring display information of an object and transmitting the display information to the display terminal, and the display terminal is used for displaying the display information; the acquisition terminal specifically comprises a holographic acquisition device and an image acquisition device, the holographic acquisition device acquires three-dimensional information of an object in real time, and the image acquisition device acquires local image information of the object according to user control; the display terminal comprises a holographic projection device and a plane display device which are integrally arranged, the holographic projection device displays a holographic image of an object in real time according to acquired three-dimensional information, and the plane display device displays acquired local image information on the three-dimensional image in an overlapping mode according to user control.

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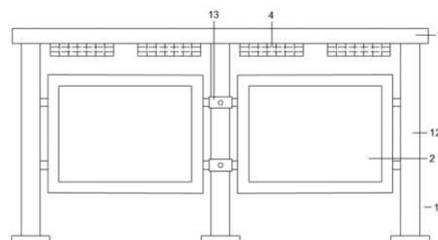
Priority Date: 08/02/2022

NANJING SANSHOUDU CULTURE MEDIA

### HOLOGRAPHIC PHOTOVOLTAIC DISPLAY DEVICE AND POWER SUPPLY CONTROL METHOD THEREOF

The invention provides a holographic photovoltaic display device and a power supply control method thereof, wherein the holographic photovoltaic display device comprises a frame body assembly and further comprises: a holographic 3D imaging system; the photovoltaic power generation energy storage system is connected with the holographic 3D imaging system and comprises a photovoltaic power generation subsystem and an intelligent energy storage subsystem; the control system is arranged in the frame body assembly and is electrically connected with the holographic 3D imaging system and the photovoltaic power generation energy storage system, the control system comprises a monitoring module, an optimizing module, a regulating and controlling module, a data analyzing module and a communication module, wherein the monitoring module is used for acquiring required monitoring data, the optimizing module is used for regulating and controlling the input and output voltages of the intelligent energy storage subsystem, the data analyzing module is used for optimizing the topological structure of the photovoltaic power generation subsystem according to the monitoring data, and the priority sequence of the intelligent energy storage subsystem is generated in real time. The invention can realize holographic naked-eye 3D image display, and can reduce energy consumption and realize power supply control through photovoltaic off-grid power generation and intelligent energy storage.

**CLAIM 1.** The utility model provides a holographic photovoltaic display device, includes the frame body subassembly, its characterized in that still includes: the holographic 3D imaging system is arranged in the frame body assembly and used for realizing holographic bare 3D imaging; the holographic 3D imaging system comprises a photovoltaic power generation subsystem and an intelligent energy storage subsystem, wherein the photovoltaic power generation subsystem is connected with the holographic 3D imaging system and is used for converting solar energy into electric energy; the control system is arranged in the frame body assembly and is electrically connected with the holographic 3D imaging system and the photovoltaic power generation energy storage system, the control system comprises a monitoring module, an optimizing module, a regulating and controlling module, a data analyzing module and a communication module, wherein the monitoring module is used for acquiring required monitoring data, the optimizing module is used for regulating and controlling the input and output voltages of the intelligent energy storage subsystem, the data analyzing module is used for optimizing the topological structure of the photovoltaic power generation subsystem according to the monitoring data, and the priority sequence of the intelligent energy storage subsystem is generated in real time.



N8677

CN114428446

Priority Date: 25/01/2022

TCL COMMUNICATION

### GRAPHIC HOLOGRAPHIC PROJECTION METHOD AND DEVICE, STORAGE MEDIUM AND TERMINAL

The embodiment of the application provides a graphic holographic projection method, a device, a storage medium and a terminal, wherein the method is applied to the terminal and comprises the following steps: acquiring the refractive index of air in the space above the terminal screen; calculating target light spot positions corresponding to all vertexes of the target graph in the upper space of the terminal screen based on the refractive index and the target graph to be projected, wherein light intensity formed by light emitted by the terminal screen at the target light spot positions meets the preset light intensity requirement; determining position information of a connecting edge between the target light spot positions based on the target light spot positions and the target graph; and performing holographic projection through the terminal screen based on the position of the target light spot and the position information of the connecting edge, and forming a holographic image corresponding to the target graph in the upper space. The embodiment of the application can display the graph on the terminal in the air in the space above the terminal to form the holographic image.

**CLAIM 1.** A graphic holographic projection method is applied to a terminal, and is characterized by comprising the following steps: acquiring the refractive index of air in the space above the terminal screen; calculating target light spot positions corresponding to all vertexes of the target graph in the upper space of the terminal screen based on the refractive index and the target graph to be projected, wherein light intensity formed by light emitted by the terminal screen at the target light spot positions meets the preset light intensity requirement; determining position information of a connecting edge between the target light spot positions based on the target light spot positions and the target graph; and performing holographic projection through the terminal screen based on the position of the target light spot and the position information of the connecting edge, and forming a holographic image corresponding to the target graph in the upper space.

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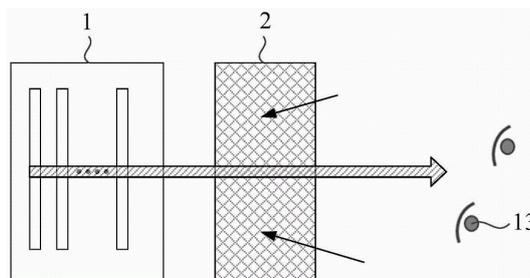
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TIANMA

Priority Date: 25/02/2022

### THREE-DIMENSIONAL HOLOGRAPHIC DISPLAY DEVICE

The invention discloses a three-dimensional holographic display device, comprising: a holographic optical assembly for outputting a three-dimensional optical image; the band-pass filtering component is positioned on the light-emitting side of the holographic optical component and is used for transmitting light rays in a first wave band and filtering light rays in a second wave band; the three-dimensional optical image comprises light rays in a first wave band. Because the three-dimensional optical image comprises the light rays with the first wave band, the output of the three-dimensional optical image can be ensured due to the band-pass filtering component, and the multi-directional three-dimensional image display of the object is realized. In addition, the light of the second wave band can be filtered out by the band-pass filtering component, the reflection of the external environment light in the three-dimensional holographic display device is reduced, most of external environment reflected light is eliminated, the contrast of the display image of the three-dimensional holographic display device is improved, and the watching experience of a user is further improved.



**CLAIM 1.** A three-dimensional holographic display, comprising: a holographic optical assembly for outputting a three-dimensional optical image; the band-pass filtering component is positioned on the light-emitting side of the holographic optical component and is used for transmitting light rays in a first wave band and filtering light rays in a second wave band; wherein the three-dimensional optical image includes light rays of the first wavelength band.

N8679

CN114397792

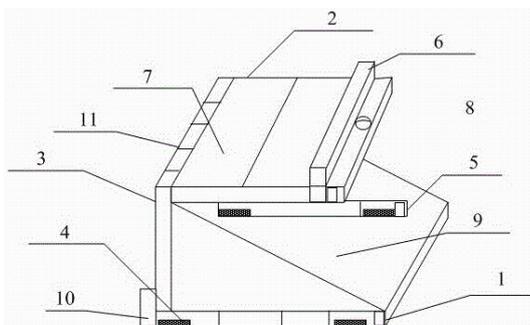
SHENZHEN STARLINK TECHNOLOGY

Priority Date: 03/03/2022

### PORTABLE HOLOGRAPHIC PROJECTION IMAGING DISPLAY

The invention provides a portable holographic projection imaging display device which comprises a lower supporting rod, an upper supporting rod, a bracket device, an anti-skid block, an inner handle, a projector bracket device, a connecting plate, a projector input port, a holographic film, a motor and a telescopic rod, wherein the lower supporting rod is connected with the upper supporting rod through the connecting plate; the lower support rod is positioned at the bottom of the portable holographic projection imager and is connected to the left side of a support base of the support device; the upper supporting rod is positioned at the upper part of the portable projection imaging display and is connected to the left side of the bracket base of the bracket device; the upper and lower parts of the bracket base of the bracket device are respectively connected with an upper supporting rod and a lower supporting rod and are electrically connected with a motor; the anti-skidding blocks are respectively positioned at the bottom part of the lower supporting rod and are respectively arranged at two ends of the lower supporting rod; through the setting of this device, can be safe, easy to assemble and folding have guaranteed the effect of broadcast.

**CLAIM 1.** A portable holographic projection imaging display device comprises a lower supporting rod (1), an upper supporting rod (2), a support device (3), an anti-skid block (4), an inner handle (5), a projector support device (6), a connecting plate (7), a projector putting port (8), a holographic film (9), a motor (10) and a connecting rod (11), and is characterized in that the upper part and the lower part of a support base I (31) of the support device (3) are respectively connected with the upper supporting rod (2) and the lower supporting rod (1) and are electrically connected with the motor (10); the anti-skidding blocks (4) are positioned at the bottom of the lower supporting rod (1) and are respectively arranged at two ends of the lower supporting rod (1); the inner handle (5) is respectively arranged at the front parts of the left sides of the upper support rod (2) and the lower support rod (1); the projector bracket device (6) is arranged at the left front part of the upper supporting rod (2).



N8680

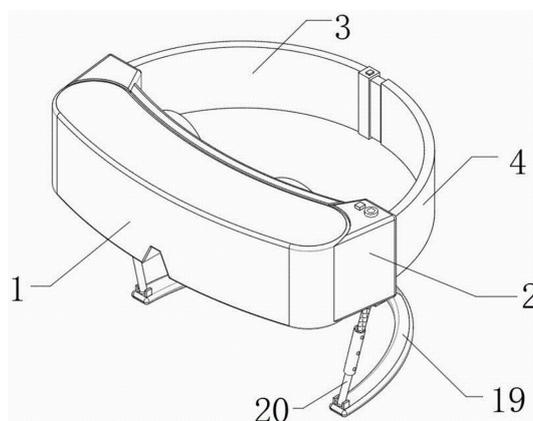
CN114392144

Priority Date: 28/12/2021

MODI TECHNOLOGY JIANGSU

### HEAD-WEARING EYE HOLOGRAPHIC VISION INSTRUMENT WITH HIGH COMFORT

The invention discloses a head-wearing eye holographic vision instrument with high comfort, and relates to the field of vision instruments. The device includes the eyesight appearance main part, and the both ends of eyesight appearance main part are equipped with the connecting seat, and the internal assembly of eyesight appearance main part has the display mirror, and the internal activity of a set of connecting seat articulates there is first bandage, and the internal assembly of a set of connecting seat has the second bandage, the one end swing joint of two sets of bandages. The device is when using, through rotating the connecting rod for it drives the movable rod and rotates, thereby makes the second bandage winding or keep away from the surface of movable rod, makes the overall length to the second bandage adjust, changes the fixed condition of bandage length among the traditional device, has the condition of difference in order to satisfy different users' head size, makes that the bandage can be stable be connected between visual acuity chart and the user head.



**CLAIM 1.** A comfortable head-wearing eye holographic vision instrument is characterized by comprising; the visual acuity tester comprises a visual acuity tester main body (1), wherein connecting seats (2) are assembled at two ends of the visual acuity tester main body (1), a display mirror (5) is assembled inside the visual acuity tester main body (1), a rubber ring (6) is assembled on the outer surface of the display mirror (5), a rubber sleeve ring (7) is assembled on one side of the rubber ring (6), the rubber sleeve ring (7) is movably sleeved on the outer surface of one end of the display mirror (5), a first binding band (3) is movably hinged inside a group of the connecting seats (2), a second binding band (4) is assembled inside a group of the connecting seats (2), a clamping seat (8) is fixedly installed at one end of the first binding band (3), a clamping plate (9) is fixedly installed at one end of the second binding band (4), and one end of the clamping plate (9) is movably clamped inside the clamping seat (8); the winding mechanism (14) comprises a pulling plate (141), a pawl (142), a rotating rod (143) and a torsion spring (144), the inside of the connecting seat (2) is rotatably connected with a movable rod (10), one end, far away from the clamping plate (9), of the second binding band (4) is wound on the outer surface of the movable rod (10), the top end of the movable rod (10) is fixedly provided with a connecting rod (12), the outer surface of the connecting rod (12) is fixedly sleeved with a ratchet wheel (13), and one end of the pawl (142) is movably clamped inside the ratchet wheel (13); one end sliding connection of arm-tie (141) is in the inside of connecting seat (2), the inside of arm-tie (141) is set up flutedly, the inside rotation of recess is connected with dwang (143), the fixed surface at dwang (143) of cup jointing of one end that ratchet (13) were kept away from in pawl (142), the surface of dwang (143) is equipped with torsional spring (144).

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

**N8642**

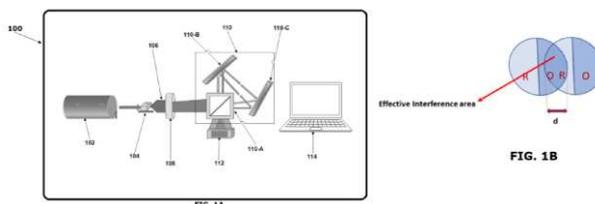
**IN202211025485**

Priority Date: 01/05/2022

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

### **TELECENTRIC DIGITAL HOLOGRAPHIC MICROSCOPY SYSTEM AND METHOD FOR EXTENDED DEPTH OF FOCUS IMAGING**

Telecentric holographic system produces a digital holographic image of sample. The system comprises illumination means, ETL, beam splitter, set of mirrors, imaging sensor and control unit. The sample is placed in half of area of illumination beam and generate sample beam, which is received by customized microscope objective to generate a first focus beam, which is received by ETL to generate a second focus beam. The beam splitter splits second focus beam into first spherical beam and second spherical beam, these beams are reflected by mirrors, towards the imaging sensor. The control unit is arranged to control current supply to ETL for adjustment in DOF of microscope objective. Control unit adjusts tilting angle of first or second mirror to generate an interference pattern to produce holographic image. The present disclosure enables simultaneous telecentric and axial scanning at an extended depth of focus to enable enhancement in extended depth of focus, image quality with greater details, superior precision and improvement in DOF.



**CLAIM 1.** A system to produce a digital holographic image of a sample, the system comprising: an illumination means that is arranged to incident a light beam towards a sample holder, which is arranged to receive the sample, wherein the sample is placed in half the area of the illumination beam, and generate a sample beam; a customized microscope objective is arranged to receive the sample beam and create a first focus beam at a back focal plane; an electrically tunable lens is disposed at the back focal plane of the customized microscope objective, wherein the electrically tunable lens is configured to adjust a focal depth of the customized microscope objective in accordance with a control input received from a control unit, wherein the electrically tunable lens receives the first focus beam and emits a second focus beam; an interferometer disposed behind the back focal plane, wherein the interferometer comprising: a beam splitter that is arranged to receive the second focus beam from the electrically tunable lens, wherein the beam splitter splits, the second focus beam into a first spherical beam and a second spherical beam, wherein the first spherical beam comprising a first object region and a first reference region; wherein the second spherical beam comprising a second object region and a second reference region; a first mirror that is arranged to receive the first spherical beam; and a second mirror that is arranged to receive the second spherical beam; an electronic imaging sensor is arranged to receive the reflected first spherical beam from the first mirror and second spherical beam from the second mirror; and the control unit is arranged to: transmit the control input to the electrically tunable lens for adjusting the focal depth of the customized microscope objective to enable simultaneous telecentric and axial scanning at an extended depth of focus, wherein the control input refers to controlling a supply of electric current to the electrically tunable lens; and control at least one of the first mirror and the second mirror to overlay the first object region and the second reference region to enable reconstruction of digital holographic image of the sample.

N8643

EP4002015

ASML

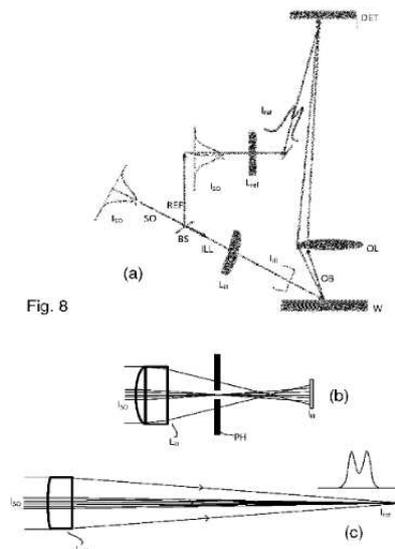
Priority Date: 16/11/2020

### DARK FIELD DIGITAL HOLOGRAPHIC MICROSCOPE AND ASSOCIATED METROLOGY METHOD

A dark field digital holographic microscope and associated metrology method is disclosed which is configured to determine a characteristic of interest of a structure. The dark field digital holographic microscope comprises an illumination branch for providing illumination radiation to illuminate said structure; an detection arrangement for capturing object radiation resulting from diffraction of the illumination radiation by said structure; and a reference branch for providing reference radiation for interfering with the object beam to obtain an image of an interference pattern formed by the illumination radiation and reference radiation. The reference branch has an optical element operable to vary a characteristic of the reference radiation so as to reduce and/or minimize variation in a contrast metric of the image within a field of view of the dark field digital holographic microscope at a detector plane.

### MICROSCOPE HOLOGRAPHIQUE NUMÉRIQUE SUR FOND NOIR ET PROCÉDÉ DE MÉTROLOGIE ASSOCIÉ

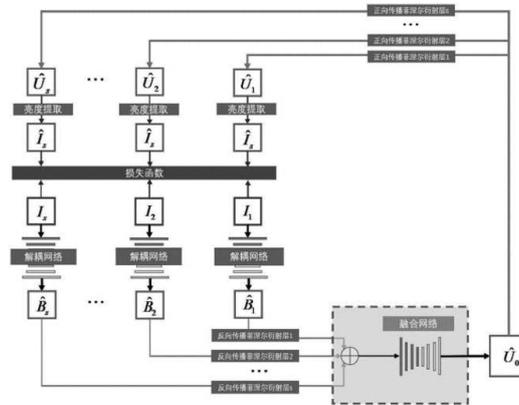
L'invention concerne un microscope holographique numérique sur fond noir et un procédé de métrologie associé qui sont conçus pour déterminer une caractéristique d'intérêt d'une structure. Le microscope holographique numérique sur fond noir comprend une branche d'éclairage servant à fournir un rayonnement d'éclairage pour éclairer ladite structure ; un agencement de détection servant à capturer un rayonnement d'objet résultant de la diffraction du rayonnement d'éclairage par ladite structure ; et une branche de référence servant à fournir un rayonnement de référence pour interférer avec le faisceau objet pour obtenir une image d'un motif d'interférence formé par le rayonnement d'éclairage et le rayonnement de référence. La branche de référence comporte un élément optique pouvant être utilisé pour faire varier une caractéristique du rayonnement de référence de façon à réduire et/ou à minimiser la variation dans une métrique de contraste de l'image dans un champ de vision du microscope holographique numérique sur fond noir au niveau d'un plan de détecteur.



**CLAIM 1.** A dark field digital holographic microscope configured to determine a characteristic of interest of a structure, comprising: an illumination branch for providing illumination radiation to illuminate said structure; a detection arrangement for capturing object radiation resulting from diffraction of the illumination radiation by said structure; a reference branch for providing reference radiation for interfering with the object beam to obtain an image of an interference pattern formed by the illumination radiation and reference radiation; and at least one reference branch optical element operable to modulate the reference radiation to impose an optimized reference illumination profile which, when multiplied by a coherence contribution function of an intensity distribution of the interference pattern, results in an effective reference illumination profile with a substantially flat top so as to reduce and/or minimize spatial variation in a contrast metric of the image within a field of view of the dark field digital holographic microscope at a detector plane.

**LENSLESS HOLOGRAPHIC MICROSCOPIC IMAGING PHASE RECOVERY METHOD BASED ON DECOUPLING-FUSION NETWORK**

The application relates to the field of computer vision and microscopic imaging, and particularly provides a lens-free holographic microscopic imaging phase recovery method based on a decoupling-fusion network. The method comprises the following steps: s1, measuring parameters of the lens-free holographic microscopic imaging system to be recovered; s2, obtaining a sample and constructing a training sample set and a testing sample set; s3, constructing a phase recovery network; s4, training the constructed phase recovery network; and S5, performing phase recovery to solve complex amplitude. The method uses a decoupling network to decouple double-channel complex matrix information from a single-channel holographic brightness image, uses a fusion network to fuse multi-frame collected information, and combines the information with a Fresnel diffraction physical model, so that the learning target is clear and the interpretability is strong; the reconstruction accuracy is high, and the visual effect of the reconstructed phase difference and amplitude image is good; the phase recovery network used by the invention needs fewer gradient descending rounds and has higher phase recovery speed.



**CLAIM 1.** A lens-free holographic microscopic imaging phase recovery method based on a decoupling-fusion network is characterized by comprising the following steps: s1, measuring parameters of the lens-free holographic microscopic imaging system to be recovered; s2, obtaining a sample and constructing a training sample set and a testing sample set; s3, constructing a phase recovery network; s4, training the constructed phase recovery network; and S5, performing phase recovery to solve complex amplitude.

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

**N8622**

**WO202289991**

Priority Date: 28/10/2020

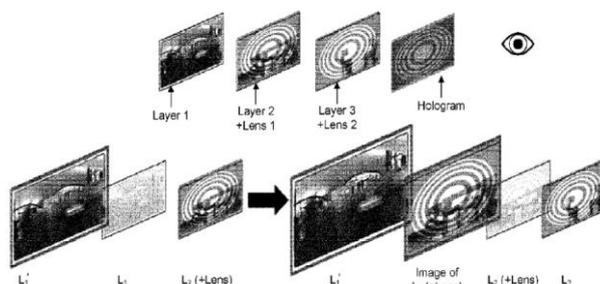
## INTERDIGITAL PATENT HOLDINGS

### SYSTEM AND METHOD FOR COMPUTER-GENERATED HOLOGRAPHY SYNTHESIS

Processing image information associated with a 3D scene can involve obtaining image data associated with at least one layer of the 3D scene; determining at least one phase increment distribution associated with the at least one layer for modifying at the at least one layer an image size associated with the scene; and determining a propagation of an image wave front, corresponding to the at least one layer, to a result layer at a distance from the scene to form a propagated image wave front at the result layer representing a hologram of the scene, wherein determining the propagation includes applying the at least one phase increment distribution associated with the at least one layer to the image wave front at the at least one layer.

### SYSTÈME ET PROCÉDÉ DE SYNTHÈSE HOLOGRAPHIQUE GÉNÉRÉE PAR ORDINATEUR

Le traitement d'informations d'image associées à une scène 3D peut consister à obtenir des données d'image associées à au moins une couche de la scène 3D ; à déterminer au moins une distribution d'incrément de phase associée auxdites couches pour modifier au niveau desdites couches une taille d'image associée à la scène ; et à déterminer une propagation d'un front d'onde d'image correspondant auxdites couches à une couche de résultat située à une certaine distance de la scène pour former au niveau de la couche de résultat un front d'onde d'image propagé qui représente un hologramme de la scène, la détermination de la propagation comprenant l'application desdites distributions d'incrément de phase associées auxdites couches au front d'onde d'image au niveau desdites couches.



**CLAIM 1.** A method comprising: obtaining image data associated with at least one layer of a 3D scene; determining at least one phase increment distribution associated with the at least one layer for modifying at the at least one layer an image size associated with the scene; and determining a propagation of an image wave front, corresponding to the at least one layer, to a result layer at a distance from the scene to form a propagated image wave front at the result layer representing a hologram of the scene, wherein determining the propagation includes applying the at least one phase increment distribution associated with the at least one layer to the image wave front at the at least one layer.

N8633

RU2770567

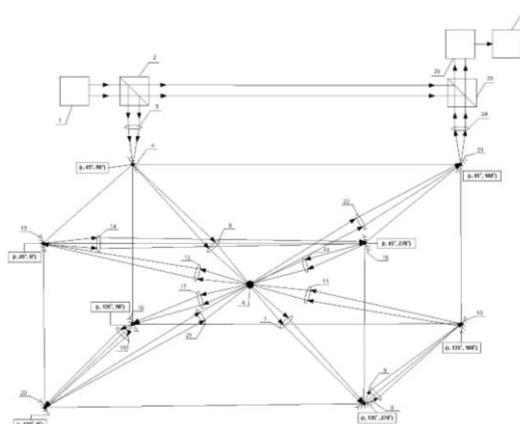
Priority Date: 26/06/2021

FEDERALNOE GOSUDARSTVENNOE BIUDZHETNOE  
OBRAZOVATELNOE UCHREZHDENIE VYSSHEGO OBRAZOVANIA  
«DONSKOI GOSUDARSTVENNYI TEKHNICHESKII UNIVERSITET»  
DGTU

### METHOD FOR HOLOGRAPHIC ANALYSIS OF SUSPENDED PARTICLES

FIELD: measuring technology.

SUBSTANCE: invention relates to the field of measuring technology and concerns a method for holographic analysis of suspended particles. The method includes illumination of the particle stream with a light beam and registration of images of particles, by which the sizes and shapes of the latter are judged. After passing through the particle stream, the light beam is unfolded in relation to the initial beam and again passed through the particle stream so that the registration of the particle image occurs from four different angles of the light beam. The light beam is coherent, and it is preliminarily divided into a reference and an object beam. In this case, the reference one is directed right to the matrix of charge-coupled devices, and the object one is directed to the matrix of charge-coupled devices through the particle flow. EFFECT: providing the possibility of automatic registration of the shape of particles and their orientation in space during the movement of the dispersed flow in the entire dimensional range of sizes and shapes and to increase the accuracy of measurements for particles of complex configuration.



N8663

CN114529679

Priority Date: 19/04/2022

TSINGHUA UNIVERSITY

### METHOD AND DEVICE FOR GENERATING COMPUTED HOLOGRAPHIC FIELD BASED ON NERVE RADIATION FIELD

The application relates to the technical field of image data processing or generation, in particular to a method and a device for generating a computer generated holographic field based on a nerve radiation field, wherein the method comprises the following steps: acquiring a three-dimensional model of a target scene; collecting color images and depth images of a target scene under a plurality of visual angles, recording corresponding angle information and internal and external parameters of a camera, generating point cloud data, and calculating a holographic amplitude image and a phase image to obtain a true value image; two-dimensional sampling is carried out on the three-dimensional model based on different angles, and a plurality of two-dimensional images are obtained; acquiring the amplitude distribution and the phase distribution of each two-dimensional image by using a preset neural network, and calculating and superposing to obtain a calculation hologram under a corresponding view angle; and obtaining the computed hologram under the corresponding visual angle through a pre-trained computed holographic field network. Therefore, the technical problem that the three-dimensional image of the target under the corresponding angle cannot be observed from multiple visual angles quickly and effectively due to the fact that the related technology is limited by factors such as the observation angle and the hologram calculation rate is solved.

**CLAIM 1.** A method for generating a computed holographic field based on a nerve radiation field, comprising the steps of: acquiring a three-dimensional model of a target scene; collecting color images and depth images of the target scene under a plurality of visual angles, and recording corresponding angle information and internal and external parameters of a camera; according to the internal and external parameters, point cloud data under corresponding visual angles are generated through the color image and the depth map, and a holographic amplitude map and a phase map under corresponding visual angles are calculated to obtain a true value image; two-dimensional sampling is carried out on the three-dimensional model in a preset depth range based on different angles, and a plurality of two-dimensional images which are parallel to each other in different depths are obtained; acquiring the amplitude distribution and the phase distribution of each two-dimensional image under a corresponding view angle by using a preset neural network, calculating the complex amplitude distribution of each two-dimensional image, and overlapping to obtain a calculation hologram under the corresponding view angle; and obtaining the computed hologram under the corresponding view angle from any observation viewpoint through a pre-trained computed hologram field network, wherein the computed hologram field network is obtained by training the computed hologram under the corresponding view angle.

N8665

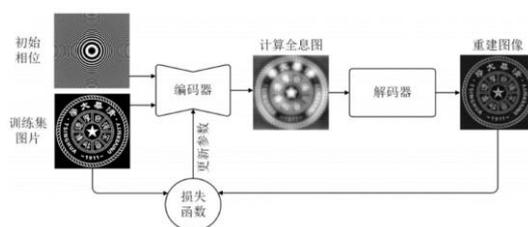
CN114494596

Priority Date: 21/01/2022

TSINGHUA UNIVERSITY

### GENERATION METHOD OF COMPUTER GENERATED HOLOGRAM AND ELECTRONIC EQUIPMENT

The invention belongs to the technical field of computer generated hologram and deep learning, and particularly relates to a computer generated hologram generating method and electronic equipment. The method comprises the following steps: acquiring an image set and generating an initial phase map; inputting the image set and the initial phase diagram into an auto-encoder neural network, and training the auto-encoder neural network to obtain a trained auto-encoder network; and inputting a target image to an encoder in the self-encoder network after training, and outputting to obtain a computed hologram of the target image. The method adopts a self-encoder network structure, does not need to label the training set in advance, solves the problems of time consumption and limitation of network training effect in label training set generation, and realizes high-speed and high-quality calculation hologram generation. And secondly, an encoder in the neural network of the self-encoder adopts a Y-Net network structure, so that the generation of a calculation hologram based on a given initial phase is realized, the training direction of the network in an unsupervised learning mode is controlled, and the network optimization and the reconstructed image quality are improved.



**CLAIM 1.** A method of generating a computed hologram, comprising: acquiring an image set and generating an initial phase map; inputting the image set and the initial phase diagram into a self-encoder neural network, and training the self-encoder neural network to obtain a trained self-encoder network; and inputting a target image to an encoder in the self-encoder network after training, and outputting to obtain a computed hologram of the target image.

N8666

CN114494139

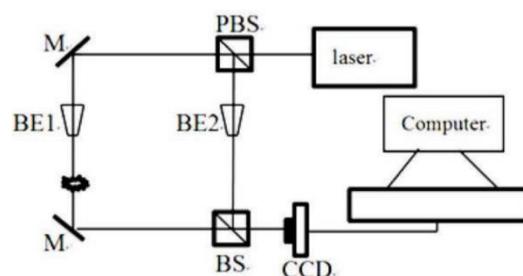
Priority Date: 28/12/2021

XIDIAN UNIVERSITY

### CHIP APPEARANCE DEFECT DETECTION METHOD BASED ON LASER HOLOGRAPHIC IMAGING TECHNOLOGY

The invention discloses a chip appearance defect detection method based on a laser holographic imaging technology, which improves the low detection efficiency of chip appearance defect detection in the prior art. The method comprises the following steps of 1, starting a laser to form a hologram, and receiving the hologram by an image acquisition module and sending the hologram into an image processing module; step 2, carrying out numerical value transformation on the hologram to obtain a digital hologram, and reconstructing a three-dimensional shape through image processing; step 3, judging whether the chip is abnormal or not according to the classification result of the support vector machine; and 4, if the judgment result is abnormal, the parallel connecting rod robot rejects the defective chip, and if the result is normal, the test of the next chip is finished. The technology solves the problem of unstable quality caused by manual judgment of subjective standard change, reduces the detection cost and improves the detection efficiency.

**CLAIM 1.** A chip appearance defect detection method based on a laser holographic imaging technology is characterized by comprising the following steps: comprises the following steps of (a) carrying out, step 1, starting a laser to form a hologram, and receiving the hologram by an image acquisition module and sending the hologram into an image processing module; step 2, carrying out numerical value transformation on the hologram to obtain a digital hologram, and reconstructing a three-dimensional shape through image processing; step 3, judging whether the chip is abnormal or not according to the classification result of the support vector machine; and 4, if the judgment result is abnormal, the parallel connecting rod robot eliminates the defective chip, and if the judgment result is normal, the test of the next chip is finished.



N8681

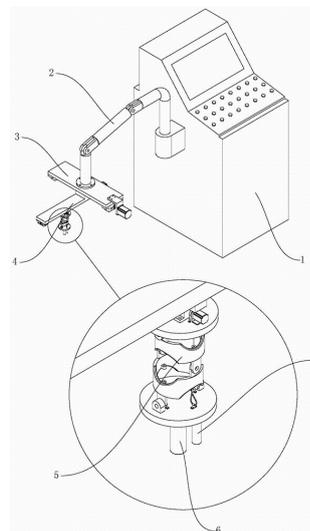
CN114391869

Priority Date: 18/01/2022

SICHUAN PROVINCIAL HOSPITAL FOR WOMEN & CHILDREN

### HOLOGRAPHIC IMAGE ULTRASONIC DIAGNOSIS DEVICE

The utility model relates to the technical field of medical diagnosis instruments, in particular to a holographic image ultrasonic diagnosis device which comprises an equipment main body, a multi-section supporting arm, a first adjusting component, a second adjusting component, an angle adjusting component, a detecting head and a camera, wherein the equipment main body is provided with the multi-section supporting arm, the first adjusting component is provided with an output end moving along the horizontal direction, the moving direction of the output end of the second adjusting component is vertical to the moving direction of the output end of the first adjusting component, the output end of the angle adjusting component is fixedly provided with the detecting head and the camera, the first adjusting component and the second adjusting component can drive the detecting head to move in the horizontal plane, the moving range of the detecting head is expanded, the detecting head can be driven to accurately move to an area to be detected, an angle adjusting mechanism is arranged, the tilting state of the detecting head can be adjusted, and the state of the area to be detected can be observed from a plurality of angles, the dead angle-free detection is carried out on the area to be detected.



**CLAIM 1.** A holographic ultrasonic diagnostic apparatus, comprising: the equipment comprises an equipment main body (1) which is provided with a multi-section supporting arm (2); the first adjusting component (3) is fixedly arranged at the end part of the multi-section supporting arm (2), and the first adjusting component (3) is provided with an output end which moves along the horizontal direction; the second adjusting component (4) is fixedly arranged at the output end of the first adjusting component (3), the second adjusting component (4) is provided with an output end which moves along the horizontal direction, and the moving direction of the output end of the second adjusting component (4) is vertical to the moving direction of the output end of the first adjusting component (3); the angle adjusting component (5) is fixedly arranged at the output end of the second adjusting component (4), the angle adjusting component (5) is provided with an output end capable of moving in a three-dimensional space, and a detecting head (6) and a camera (7) are fixedly arranged at the output end of the angle adjusting component (5).

N8682

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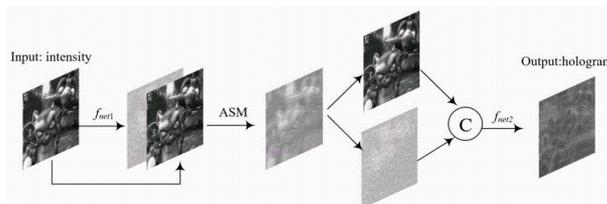
Priority Date: 11/01/2022

CHINA UNIVERSITY OF MINING & TECHNOLOGY

### PHASE-DOUBLE RESOLUTION RATIO NETWORK-BASED QUICK HOLOGRAM GENERATION METHOD

The invention discloses a phase-double resolution ratio network-based hologram rapid generation method, which comprises the following steps: the method has the advantages that a real pure phase hologram mask does not need to be manufactured, the micromation of an angular spectrum method is utilized, and the unsupervised training of a convolutional neural network is realized by using a natural image; the convolutional layer learns feature mapping in the same space, rather than learning feature mapping across distances; reducing the network model calculation amount and the memory occupancy rate of the GPU by using the void convolution and the group convolution; a combination of MS-SSIM and MSE losses is used as a consistency loss function to generate a reconstructed map that is more consistent with the human visual system. The calculation of the method for generating the 1080P resolution hologram only needs 57 milliseconds, and the peak signal-to-noise ratio of the optimal numerical reconstruction image and the target intensity image reaches 31.17 dB.

**CLAIM 1.** A phase-double resolution ratio network-based hologram rapid generation method is characterized in that: (1) construction of phase-Dual resolution network model  $f_{net1}$  and  $f_{net2}$ ; (2) Trained phase-dual resolution network  $f_{net1}$  Calculating an initial phase  $\phi$  according to the input target intensity map  $I_0$ ; (3) According to the initial phase  $\phi$  Calculating a complex value wave field  $U$  with the target intensity graph  $I_z(ii)$  a From the angle spectrum method, a complex-valued wavefield  $U$  is calculated  $z$  Complex wave field  $U$  obtained after propagation of- $z$  in free space  $0$ ; (4) Trained phase-dual resolution network  $f_{net2}$  From the input complex-valued wavefield  $U_0$  A phase-only hologram is calculated.



**IHMA - MAY 2022 - 119 ISSUED PATENTS - PAGE 1**

**HOLOGRAMS - 25 PATENTS**

REFERENCE	COUNTRY	PATENT NUMBER	PUBLICATION DATE Day-Month-Year	APPLICANT	PRIORITY	PRIORITY DATE Day-Month-Year	PRIORITY NUMBER	EQUIVALENTS	TITLE	KEY WORDS
<a href="#">P34938</a>	WO	2022102751	19/05/2022	DAI NIPPON PRINTING	JP	13/11/2020	JP2020000189604	WO2022102751	LAMINATE, PRINT PRODUCT, AND METHOD USING LAMINATE	OVD - Microlens
<a href="#">P34969</a>	US	20220161570	26/05/2022	NANOGRAFIX	US	24/11/2020	US2020063117700	US20220161570 WO2022115336	METHODS AND SYSTEMS FOR GENERATING VARIABLE DIGITAL OPTICAL IMAGES ON A SUBSTRATE USING A THERMAL HEAD	
<a href="#">P34970</a>	US	20220139143	05/05/2022	AU10TIX	US	03/11/2020	US2020017087877	US20220139143 WO202297132	SYSTEM, METHOD AND COMPUTER PROGRAM PRODUCT FOR ASCERTAINING DOCUMENT LIVENESS	
<a href="#">P34977</a>	RU	210499	18/04/2022	GOZNAK	RU	30/08/2021	RU2021000125514	RU-210499	SELF-ADHESIVE FILM STRUCTURE	
<a href="#">P34981</a>	KR	20220065348	20/05/2022	PARK, JUNG-HO   SHIN, DAE SIK	KR	13/11/2020	KR2020000151738	KR20220065348	HOLOGRAM COMPOSITE SHEET	
<a href="#">P34982</a>	KR	20220064498	19/05/2022	FUTURE TECHNOLOGY	KR	12/11/2020	KR2020000150601	KR20220064498	AUTHENTICATION METHOD USING A COMPUTER-GENERATED HOLOGRAM	
<a href="#">P35007</a>	IN	202011037550	29/04/2022	BHATT PANKAJ	IN	31/08/2020	IN2020011037550	IN202011037550	METHOD FOR MAKING A HOLOGRAPHIC FLEXIBLE LAMINATE	
<a href="#">P35008</a>	IN	202011037548	29/04/2022	BHATT PANKAJ	IN	31/08/2020	IN2020011037548	IN202011037548	A METHOD OF MAKING A HOLOGRAPHIC BARRIER TUBES AND A HOLOGRAPHIC TUBE THEREOF	
<a href="#">P35019</a>	EP	3995904	11/05/2022	BUNDESDRUCKEREI	DE	04/11/2020	DE202010213901	DE102020213901 EP3995904	METHOD FOR PRODUCING A SECURITY HOLOGRAM AND SECURITY HOLOGRAM	Passport
<a href="#">P35020</a>	EP	3995318	11/05/2022	BUNDESDRUCKEREI	DE	06/11/2020	DE202010129323	EP3995318 DE102020129323	DATA CARRIER FOR A SECURITY OR VALUE DOCUMENT WITH A MAGNETIC SECURITY FEATURE	
<a href="#">P35022</a>	EP	3989187	27/04/2022	BUNDESDRUCKEREI	DE	22/10/2020	DE202010127879	EP3989187 DE102020127879	METHOD FOR VERIFYING THE AUTHENTICITY OF A SECURITY FEATURE OF A VALUE OR SECURITY PRODUCT FORMED FROM SEVERAL PARTS	Smartphone
<a href="#">P35024</a>	EP	3989007	27/04/2022	BUNDESDRUCKEREI	DE	22/10/2020	DE202010127878	EP3989007 DE102020127878	VALUABLE OR SECURITY PRODUCT AND METHOD FOR VERIFYING THE SAME	
<a href="#">P35026</a>	DE	102020129468	12/05/2022	BCTSL SERVICES	DE	09/11/2020	DE202010129468	DE102020129468	SECURITY LABEL	
<a href="#">P35036</a>	CN	216507550	13/05/2022	GUANGDONG RUIXIANG SHANGCAI TECHNOLOGY	CN	02/12/2021	CN2021003026981	CN216507550U	HOLOGRAPHIC POSITIONING ANTI-COUNTERFEITING HOT STAMPING FILM PROCESSING DEVICE	
<a href="#">P35037</a>	CN	216490680	10/05/2022	SHENYANG BOXING YADA TECHNOLOGY	CN	07/06/2021	CN2021001259799	CN216490680U	CAMERA DEVICE, AND LASER HOLOGRAPHIC IMAGING DEVICE AND SYSTEM ADOPTING SAME	Passport
<a href="#">P35038</a>	CN	216487008	10/05/2022	WENZHOU HAUGE ANTI COUNTERFEITING TECHNOLOGY	CN	13/12/2021	CN2021003134689	CN216487008U	NOVEL LASER HOLOGRAPHIC POSITIONING COMBINED ANTI-COUNTERFEIT LABEL	
<a href="#">P35039</a>	CN	216487000	10/05/2022	SHENZHEN JINSHENGCAI PACKAGING MATERIAL	CN	22/06/2021	CN2021001404917	CN216487000U	HOLOGRAPHIC RECORDING PHOTSENSITIVE ANTI-COUNTERFEITING POLYMERIZED PAPER	
<a href="#">P35049</a>	CN	216456834	10/05/2022	HOLOTEK TECHNOLOGY	CN	16/11/2021	CN2021002808274	CN216456834U	PHOTOETCHING RELIEF LASER HOLOGRAPHIC PATTERN STRUCTURE AND GAME CARD	
<a href="#">P35052</a>	CN	216388552	26/04/2022	SHENZHEN CRYSTAL SOURCE LASER TECHNOLOGY PRODUCT	CN	18/11/2021	CN2021002834612	CN216388552U	360-DEGREE OPTICAL ZOOMING TECHNOLOGY MARK	
<a href="#">P35054</a>	CN	114525701	24/05/2022	GUANGZHOU HUADU LIANHUA PACKING MATERIAL	CN	01/03/2022	CN2022000200803	CN114525701	DYNAMICALLY DRIFTING SEAL PAPER	
<a href="#">P35071</a>	CN	114434997	06/05/2022	JIANGSU SUNDERRAY LASER PACKAGING MATERIALS	CN	26/01/2022	CN2022000092860	CN114434997	NICKEL-FREE WIDE-WIDTH FILM PRESSING FILM AND PROCESSING TECHNOLOGY THEREOF	
<a href="#">P35074</a>	CN	114419985	29/04/2022	GUO JIANJIN	CN	24/02/2022	CN2022000166396	CN114419985	HOLOGRAPHIC ANTI-COUNTERFEIT LABEL	
<a href="#">P35075</a>	CN	114419984	29/04/2022	WUHAN HUAGONG IMAGE TECHNOLOGY & DEVELOPMENT	CN	16/02/2022	CN2022000141019	CN114419984	COLORFUL HOLOGRAPHIC ANTI-COUNTERFEITING MARK FILM AND PREPARATION METHOD THEREOF	
<a href="#">P35078</a>	CN	114411096	29/04/2022	GUANGDONG RUIXIANG SHANGCAI TECHNOLOGY	CN	24/01/2022	CN2022000077329	CN114411096	LASER HOLOGRAPHIC ANTI-COUNTERFEITING COMPOSITE ALUMINIZER AND PRODUCTION PROCESS THEREOF	
<a href="#">P35085</a>	CN	114394331	26/04/2022	YICHANG CITY MINGYANG PACKING	CN	30/12/2021	CN2021001640747	CN114394331	ANTI-FAKE GIFT BOX	

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**VARIOUS OPTICAL EFFECTS - 30 PATENTS**

REFERENCE	COUNTRY	PATENT NUMBER	PUBLICATION DATE Day-Month-Year	APPLICANT	PRIORITY	PRIORITY DATE Day-Month-Year	PRIORITY NUMBER	EQUIVALENTS	TITLE	KEY WORDS
<a href="#">P34930</a>	WO	2022106809	27/05/2022	DE LA RUE INTERNATIONAL	GB	17/11/2020	GB202000018041	WO2022106809 GB202018041 GB202116249	SECURITY DEVICE AND METHOD OF MANUFACTURE THEREOF	
<a href="#">P34935</a>	WO	2022106050	27/05/2022	GIESECKE & DEVRIENT CURRENCY TECHNOLOGY	DE	17/11/2020	DE202010007028	DE102020007028 WO2022106050	SECURITY ELEMENT, VALUE DOCUMENT EQUIPPED WITH THE SAME AND PRODUCTION METHOD	
<a href="#">P34938</a>	WO	2022102751	19/05/2022	DAI NIPPON PRINTING	JP	13/11/2020	JP202000189604	WO2022102751	LAMINATE, PRINT PRODUCT, AND METHOD USING LAMINATE	Hologram - Microlens
<a href="#">P34943</a>	WO	2022101225	19/05/2022	SICPA	EP	10/11/2020	EP2020000206794	WO2022101225	UV-VIS RADIATION CURABLE SECURITY INKS FOR PRODUCING DICHROIC SECURITY FEATURES	
<a href="#">P34944</a>	WO	2022101224	19/05/2022	SICPA	EP	10/11/2020	EP2020000206740	WO2022101224	UV-VIS RADIATION CURABLE SECURITY INKS FOR PRODUCING DICHROIC SECURITY FEATURES	
<a href="#">P34945</a>	WO	2022101207	19/05/2022	BASF	EP	10/11/2020	EP2020000206698	WO2022101207	COMPOSITIONS, COMPRISING SILVER NANOPLATELETS	
<a href="#">P34946</a>	WO	2022100883	19/05/2022	GIESECKE & DEVRIENT CURRENCY TECHNOLOGY	DE	10/11/2020	DE202010006902	DE102020006902 WO2022100883	OPTICALLY VARIABLE SECURITY ELEMENT AND METHOD FOR PRODUCING AN OPTICALLY VARIABLE SECURITY ELEMENT	
<a href="#">P34947</a>	WO	2022100881	19/05/2022	GIESECKE & DEVRIENT CURRENCY TECHNOLOGY	DE	16/11/2020	DE202010007013	WO2022100881 DE102020007013	OPTICALLY VARIABLE SECURITY ELEMENT HAVING A REFLECTIVE/TRANSMISSIVE FEATURE REGION	
<a href="#">P34948</a>	WO	2022100463	19/05/2022	CHINA BANKNOTE PRINTING & MINT   CHINA BANKNOTE PRINTING & MINTING   ZHONGCHAO SPECIAL SECURITY TECHNOLOGY	CN	11/11/2020	CN2020001258235	WO2022100463 CN114475044	OPTICAL ANTI-COUNTERFEITING ELEMENT AND MANUFACTURING METHOD THEREFOR, AND ANTI-COUNTERFEITING PRODUCT	Microlens
<a href="#">P34949</a>	WO	2022100462	19/05/2022	CHINA BANKNOTE PRINTING & MINT   CHINA BANKNOTE PRINTING & MINTING   ZHONGCHAO SPECIAL SECURITY TECHNOLOGY	CN	11/11/2020	CN2020001255955	WO2022100462 CN114475043	OPTICAL ANTI-COUNTERFEITING ELEMENT, MANUFACTURING METHOD THEREFOR, AND ANTI-COUNTERFEITING PRODUCT	
<a href="#">P34950</a>	WO	202296892	12/05/2022	DE LA RUE INTERNATIONAL	GB	06/11/2020	GB2020000017586	WO202296892 GB202017586	OPTICAL DEVICES AND METHODS OF MANUFACTURE THEREOF	
<a href="#">P34951</a>	WO	202296833	12/05/2022	BANQUE DE FRANCE	FR	06/11/2020	FR2020000011403	WO202296833 FR3116022	METHOD FOR PRODUCING A SECURITY DOCUMENT	
<a href="#">P34959</a>	WO	202288815	05/05/2022	CHINA BANKNOTE PRINTING & MINT   CHINA BANKNOTE PRINTING & MINTING   ZHONGCHAO SPECIAL SECURITY TECHNOLOGY	CN	29/10/2020	CN2020001183476	WO202288815 CN114428391	OPTICAL ANTI-COUNTERFEITING ELEMENT AND ANTI-COUNTERFEITING PRODUCT COMPRISING OPTICAL ANTI-COUNTERFEITING ELEMENT	Microlens
<a href="#">P34961</a>	WO	202287550	28/04/2022	WAVEFRONT TECHNOLOGY	US	21/10/2020	US2020063094794	WO202287550	OPTICAL SWITCH DEVICES	Microlens
<a href="#">P34968</a>	US	20220161590	26/05/2022	GEMALTO   THALES DIS	US	26/11/2020	US2020017105592	US20220161590 WO2022112264	PERSONALIZABLE COLOR-SHIFTING DATA CARRIER	Microlens
<a href="#">P34989</a>	JP	2022075250	18/05/2022	TOPPAN PRINTING	JP	06/11/2020	JP2020000185923	JP2022075250	COLORING SHEET, COLORING ARTICLE, TRANSFER FOIL, AND METHOD OF PRODUCING TRANSFER FOIL	
<a href="#">P34997</a>	JP	2022065356	27/04/2022	TOPPAN PRINTING	JP	15/10/2020	JP2020000173876	JP2022065356	DISPLAY BODY AND METHOD FOR DETERMINING AUTHENTICITY OF DISPLAY BODY	
<a href="#">P35009</a>	GB	2600673	11/05/2022	DE LA RUE INTERNATIONAL	GB	11/09/2020	GB2020000014330	GB202014330 GB2600673	SECURITY DOCUMENTS, SECURITY DOCUMENT SHEETS AND METHODS OF MANUFACTURE THEREOF	
<a href="#">P35016</a>	EP	4000942	25/05/2022	HUECK FOLIEN	EP	16/11/2020	EP2020000207800	EP4000942	SECURITY ELEMENT HAVING MACHINE READABLE SECURITY FEATURES	
<a href="#">P35017</a>	EP	4000941	25/05/2022	GIESECKE & DEVRIENT CURRENCY TECHNOLOGY	DE	19/11/2020	DE202010007088	DE102020007088 EP4000941	SECURITY ELEMENT OF A SECURITY DOCUMENT WITH MOTIF ELEMENT ON MARKING LAYER AND METHOD FOR PRODUCING A SECURITY ELEMENT	
<a href="#">P35018</a>	EP	4000940	25/05/2022	IDEMIA FRANCE	EP	20/11/2020	EP2020000306425	EP4000940	SECURITY DOCUMENT IN WHICH A WINDOW COMPRISES AN OVM PART AND A PHOTOCHROMIC OR THERMOCHROMIC MATERIAL PART	Passport - Microlens
<a href="#">P35029</a>	CN	216585922	24/05/2022	NANJING JUFA NEW MAT	CN	31/12/2020	CN20200003119214	CN216585922U	ALUMINIZED LASER PAPER CONTAINING POLYURETHANE RESIN COATING LAYER	
<a href="#">P35032</a>	CN	216527758	13/05/2022	BEIJING XINGHAN SPECIAL PRINTING	CN	27/12/2021	CN2021003308154	CN216527758U	ANTI-FAKE CLOTHING DROP	

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**VARIOUS OPTICAL EFFECTS - 30 PATENTS (continuation)**

REFERENCE	COUNTRY	PATENT NUMBER	PUBLICATION DATE Day-Month-Year	APPLICANT	PRIORITY	PRIORITY DATE Day-Month-Year	PRIORITY NUMBER	EQUIVALENTS	TITLE	KEY WORDS
<a href="#">P35046</a>	CN	216467016	10/05/2022	ZHEJIANG RONGYIN NEW MATERIAL TECHNOLOGY	CN	09/11/2021	CN2021002733800	CN216467016U	COLOR ANTI-COUNTERFEITING BINDING PAPER WITH THREE-DIMENSIONAL EFFECT	
<a href="#">P35048</a>	CN	216466707	10/05/2022	NIPPON CARBIDE KOGYO	CN	22/12/2021	CN2021003244400	CN216466707U	RETRO-REFLECTION SHEET WITH SUBSTRATE AND CAPABLE OF BEING PRINTED BY CARBON RIBBON	Microprism
<a href="#">P35065</a>	CN	114475031	13/05/2022	HUIZHOU HUAYANG OPTICAL TECHNOLOGY	CN	30/12/2021	CN2021001657030	CN114475031	3D BALL EFFECT GENERATION DEVICE AND METHOD	
<a href="#">P35069</a>	CN	114454638	10/05/2022	CHINA BANKNOTE PRINTING TECHNOLOGY RESEARCH INSTITUTE	CN	05/01/2022	CN2022000005922	CN114454638	OPTICALLY VARIABLE MAGNETIC INK PRINTED PRODUCT, MANUFACTURING METHOD AND MANUFACTURING EQUIPMENT THEREOF	
<a href="#">P35080</a>	CN	114407547	29/04/2022	JIANGSU TAIJIA NEW MATERIAL TECHNOLOGY	CN	29/12/2021	CN2021001637625	CN114407547	WASHABLE ANTI-COUNTERFEITING HOT STAMPING FILM AND PREPARATION METHOD THEREOF	
<a href="#">P35081</a>	CN	114407544	29/04/2022	QINGDAO JUSTO PACKAGING	CN	24/01/2022	CN2022000080357	CN114407544	PREPARATION METHOD OF MULTIDIMENSIONAL REFRACTION THREE-DIMENSIONAL TIPPING PAPER	
<a href="#">P35089</a>	CN	114378968	22/04/2022	SHENZHEN DUOHEYING NEW MATERIAL	CN	12/01/2022	CN2022000033994	CN114378968	GAS FILM WITH ANTI-COUNTERFEITING EFFECT AND PRODUCTION METHOD THEREOF	

**NON SECURITY HOLOGRAMS - 65 PATENTS**

REFERENCE	COUNTRY	PATENT NUMBER	PUBLICATION DATE Day-Month-Year	APPLICANT	PRIORITY	PRIORITY DATE Day-Month-Year	PRIORITY NUMBER	EQUIVALENTS	TITLE	KEY WORDS
<a href="#">N8618</a>	WO	2022107962	27/05/2022	HOLOLAB	KR	19/11/2020	KR2020000155100	WO2022107962 KR20220068377	SYSTEM AND OPERATION METHOD FOR HOLOGRAPHIC HEAD-UP DISPLAY BASED ON MICROMIRROR ARRAY ELEMENT	
<a href="#">N8619</a>	WO	2022103020	19/05/2022	KOREA ELECTRONICS TECHNOLOGY INSTITUTE   KYUNGPOOK NATIONAL UNIVERSITY INDUSTRY ACADEMIC COOPERATION FOUNDATION	KR	13/11/2020	KR2020000151969	WO2022103020 KR20220065446	HOLOGRAPHIC PRINTER ADJUSTING DIRECTION OF OBJECT LIGHT AND REFERENCE LIGHT IN HOGL UNIT	
<a href="#">N8620</a>	WO	2022101194	19/05/2022	SAINT GOBAIN GLASS	EP	11/11/2020	EP2020000206834	WO2022101194	LAMINATED PANE COMPRISING A HOLOGRAM ELEMENT AND AN ELECTROCHROMIC FUNCTIONAL ELEMENT	
<a href="#">N8621</a>	WO	202290232	05/05/2022	VALEO COMFORT & DRIVING ASSISTANCE	FR	26/10/2020	FR2020000010968	WO202290232	HEAD-UP DISPLAY WITH HOLOGRAPHIC SLIDE	
<a href="#">N8622</a>	WO	202289991	05/05/2022	INTERDIGITAL PATENT HOLDINGS	EP	28/10/2020	EP2020000306294	WO202289991	SYSTEM AND METHOD FOR COMPUTER-GENERATED HOLOGRAPHY SYNTHESIS	
<a href="#">N8623</a>	WO	202284619	28/04/2022	BIOASTER   BIOMERIEUX	FR	20/10/2020	FR2020000010751	WO202284619 FR3115372	DIGITAL HOLOGRAPHIC IMAGING TECHNIQUE WITH TWIN IMAGE ELIMINATION	
<a href="#">N8624</a>	US	20220165714	26/05/2022	MICRON TECHNOLOGY	US	24/11/2020	US2020017102760	US20220165714 WO2022115359	STACKED LIGHT EMITTING DIODE (LED) HOLOGRAM DISPLAY	
<a href="#">N8625</a>	US	20220163919	26/05/2022	GM GLOBAL TECHNOLOGY OPERATIONS	US	23/11/2020	US2020017101013	US20220163919 DE102021114081 CN114527564	MICROMIRROR PIXEL DESIGN TO ELIMINATE INTENSITY ARTIFACTS IN HOLOGRAPHIC DISPLAYS	
<a href="#">N8626</a>	US	20220161120	26/05/2022	SAGA HOLOGRAPHIC	US	25/11/2020	US2020063118149	US20220161120 WO2022115484	EXERCISE APPARATUS WITH INTEGRATED HOLOGRAPHIC DISPLAY	
<a href="#">N8627</a>	US	20220155503	19/05/2022	FACEBOOK TECHNOLOGIES	US	16/11/2020	US2020063114226	US20220155503 WO2022104277	CHEMICAL DIFFUSION TREATED VOLUME HOLOGRAMS AND METHODS FOR MAKING THE SAME	
<a href="#">N8628</a>	US	20220153895	19/05/2022	FACEBOOK TECHNOLOGIES	US	13/11/2020	US2020063113738	US20220153895 WO2022104137	SUBSTITUTED PROPANE-CORE MONOMERS AND POLYMERS THEREOF FOR VOLUME BRAGG GRATINGS	
<a href="#">N8629</a>	US	20220153693	19/05/2022	FACEBOOK TECHNOLOGIES	US	13/11/2020	US2020063113744	US20220153693 WO2022104113	SUBSTITUTED MONO- AND POLY-PHENYL-CORE MONOMERS AND POLYMERS THEREOF FOR VOLUME BRAGG GRATINGS	
<a href="#">N8630</a>	US	20220137556	05/05/2022	ELECTRONICS & TELECOMMUNICATIONS RESEARCH INSTITUTE	KR	02/11/2020	KR2020000144422	US20220137556 KR20220060010	OPERATION METHOD FOR DIGITAL HOLOGRAM IMPLEMENTATION DEVICE	
<a href="#">N8631</a>	TW	625942	21/04/2022	DAI DAOXUAN	TW	24/11/2021	TW2021000213899	TWM625942	ORNAMENTS WITH HOLOGRAPHIC PROJECTION.	

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**NON SECURITY HOLOGRAMS - 65 PATENTS (continuation)**

REFERENCE	COUNTRY	PATENT NUMBER	PUBLICATION DATE Day-Month-Year	APPLICANT	PRIORITY	PRIORITY DATE Day-Month-Year	PRIORITY NUMBER	EQUIVALENTS	TITLE	KEY WORDS
<a href="#">N8632</a>	RU	2771005	25/04/2022	OBSHCHESTVO S OGRANICHENNOJ OTVETSTVENNOSTYU SMART ENDZHINS SERVIS	RU	22/07/2021	RU2021000121819	RU2771005	METHOD FOR DETECTING HOLOGRAPHIC PROTECTION ON DOCUMENTS IN A VIDEO STREAM	
<a href="#">N8633</a>	RU	2770567	18/04/2022	FEDERALNOE GOSUDARSTVENNOE BIUDZHETNOE OBRAZOVATELNOE UCHREZHDENIE VYSSHEGO OBRAZOVANIA «DONSKOI GOSUDARSTVENNYI TEKHNICHESKII UNIVERSITET» DGTU	RU	26/06/2021	RU2021000118658	RU2770567	METHOD FOR HOLOGRAPHIC ANALYSIS OF SUSPENDED PARTICLES	
<a href="#">N8634</a>	KR	20220064834	19/05/2022	HANGYO HOLOGRAM	KR	12/11/2020	KR2020000151379	KR20220064834	HOLOGRAM RECORDING APPARATUS AND METHOD	
<a href="#">N8635</a>	KR	20220061532	13/05/2022	FUTURE TECHNOLOGY	KR	06/11/2020	KR2020000147619	KR20220061532	METHOD FOR WRITING RGB COLOR IMAGES TO PHOTORESIST PLATES WITH SURFACE IRREGULARITIES HOLOGRAMS USING A SINGLE LASER LIGHT SOURCE	
<a href="#">N8636</a>	KR	20220059880	10/05/2022	KYUNGPOOK NATIONAL UNIVERSITY INDUSTRY ACADEMIC COOPERATION FOUNDATION	KR	03/11/2020	KR2020000145255	KR20220059880	HOLOGRAM PRINTER FOR MOVING CYLINDRICAL LENS TO ADJUST HOLOGEL POSITION	
<a href="#">N8637</a>	KR	20220059223	10/05/2022	CLOUDLINE	KR	02/11/2020	KR2020000144562	KR20220059223	MOVABLE INTERVERTEBRAL PLATE DEVICE USING HOLOGRAM	
<a href="#">N8638</a>	KR	20220056112	04/05/2022	KOREA ELECTRONICS & TELECOMMUNICATIONS RESEARCH INSTITUTE	KR	27/10/2020	KR2020000140439	KR20220056112	DIGITAL HOLOGRAPHIC DISPLAY DEVICE AND DIGITAL HOLOGRAPHIC IMAGE REPRODUCTION METHOD	
<a href="#">N8639</a>	KR	20220049218	21/04/2022	LG CHEM	KR	14/10/2020	KR2020000132582	KR20220049218	HOLOGRAPHIC OPTICAL ELEMENT AND HOLOGRAPHIC LIGHT GUIDE PLATE USING THE SAME	
<a href="#">N8640</a>	JP	2022061900	19/04/2022	JAPAN BROADCASTING	JP	07/10/2020	JP2020000170152	JP2022061900	HOLOGRAM RECORDING/REPRODUCTION METHOD AND HOLOGRAM RECORDING/REPRODUCTION DEVICE	
<a href="#">N8641</a>	JP	2022061899	19/04/2022	JAPAN BROADCASTING	JP	07/10/2020	JP2020000170151	JP2022061899	MODULATION CODE GENERATION METHOD AND HOLOGRAM RECORDING/REPRODUCTION DEVICE	
<a href="#">N8642</a>	IN	202211025485	06/05/2022	KUMARI VINEETA   BARAK NEELAM   SHEORAN GYANENDRA   SHARMA AJAY KUMAR	IN	01/05/2022	IN2022011025485	IN202211025485	TELECENRIC DIGITAL HOLOGRAPHIC MICROSCOPY SYSTEM AND METHOD FOR EXTENDED DEPTH OF FOCUS IMAGING	
<a href="#">N8643</a>	EP	4002015	25/05/2022	ASML	EP	16/11/2020	EP2020000207848	WO2022100939 EP4002015	DARK FIELD DIGITAL HOLOGRAPHIC MICROSCOPE AND ASSOCIATED METROLOGY METHOD	
<a href="#">N8644</a>	EP	4002001	25/05/2022	SAMSUNG ELECTRONICS	KR	23/11/2020	KR2020000158030	EP4002001 US20220163920 CN114527582	BEAM DEFLECTION APPARATUS AND HOLOGRAPHIC DISPLAY APPARATUS INCLUDING THE SAME	
<a href="#">N8645</a>	EP	3998501	18/05/2022	LUMINIT	US	27/10/2020	US2020017080929	US20220128814 EP3998501 JP2022070830 KR20220056138 CN114488531	ELIMINATING GLARE IN HEAD-UP DISPLAYS	
<a href="#">N8646</a>	CN	216596936	24/05/2022	ZHUHAI HENGQIN MEGA CAO PHOTOELECTRIC TECHNOLOGY	CN	19/01/2022	CN2022000145680	CN216596936U	HOLOGRAPHIC STORAGE NANOMETER FOCUSING AND TRACKING DEVICE	
<a href="#">N8647</a>	CN	216596178	24/05/2022	VOLKSWAGEN	CN	29/10/2021	CN2021002625667	CN216596178U	HOLOGRAPHIC PROJECTION DEVICE AND VEHICLE	
<a href="#">N8648</a>	CN	216595877	24/05/2022	SHENZHEN HORION SOFTWARE	CN	27/12/2021	CN2021003329207	CN216595877U	HOLOGRAPHIC PROJECTION EQUIPMENT AND SYSTEM	
<a href="#">N8649</a>	CN	216582051	24/05/2022	CHINA TOBACCO YUNNAN INDUSTRIAL	CN	23/09/2021	CN2021002294179	CN216582051U	FOLDABLE PYRAMID HOLOGRAPHIC PROJECTION IMAGING BODY, PACKAGING BOX AND CIGARETTE PACKAGING STRIP BOX	
<a href="#">N8650</a>	CN	216580122	24/05/2022	SHANGHAI MENGYUN HOLOGRAPHIC TECHNOLOGY	CN	10/11/2021	CN2021002741437	CN216580122U	HOLOGRAPHIC DISPLAY STRUCTURE OF AUTOMOBILE INSTRUMENT	
<a href="#">N8651</a>	CN	216558521	17/05/2022	NANTONG TENG FENG OPTICAL INSTRUMENT	CN	23/12/2021	CN2021003257212	CN216558521U	INTELLIGENT HOLOGRAPHIC SIGHTING TELESCOPE	
<a href="#">N8652</a>	CN	216556302	17/05/2022	STATE GRID CORPORATION OF CHINA	CN	01/09/2021	CN2021002095219	CN216556302U	HOLOGRAPHIC 3D DISPLAY DEVICE	
<a href="#">N8653</a>	CN	216526752	13/05/2022	FUTURUS TECHNOLOGY	CN	31/05/2021	CN2021001193233	CN216526752U	HOLOGRAPHIC KEYBOARD, HOLOGRAPHIC FOUNTAIN AND HOLOGRAPHIC FIREWORK	

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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
<a href="#">N8654</a>	CN	216526722	13/05/2022	XI AN YONGMING INFORMATION TECHNOLOGY	CN	28/10/2021	CN2021002613205	CN216526722U	INTELLIGENT THREE-DIMENSIONAL HOLOGRAPHIC PROJECTION EQUIPMENT	
<a href="#">N8655</a>	CN	216486994	10/05/2022	SHANGHAI JIANKE ARCH DESIGN INSTITUTE	CN	25/11/2021	CN2021002926838	CN216486994U	HOLOGRAPHIC ANALOGUE MEANS FOR ARCHITECTURAL DESIGN	
<a href="#">N8656</a>	CN	216486004	10/05/2022	SHENZHEN SHANSHUI ORIGINAL CARTOON CULTURE	CN	05/01/2022	CN2022000012392	CN216486004U	360-DEGREE HOLOGRAPHIC PROJECTION DEVICE	
<a href="#">N8657</a>	CN	216480080	10/05/2022	INNER MONGOLIA MAISUI CULTURE MEDIA	CN	19/11/2021	CN2021002859546	CN216480080U	BE APPLIED TO INDOOR HOLOGRAPHIC PROJECTION DISPLAY DEVICE	
<a href="#">N8658</a>	CN	216434491	03/05/2022	SOOCHOW UNIVERSITY	CN	29/12/2021	CN2021003338335	CN216434491U	DISMANTLE CONVENIENT CONNECTION STRUCTURE FOR HOLOGRAPHIC WAVEGUIDE LENS	
<a href="#">N8659</a>	CN	216391261	26/04/2022	HANGZHOU COOLA CULTURE DEVELOPMENT	CN	25/08/2021	CN2021002011974	CN216391261U	STAGE HOLOGRAPHIC DISPLAY SYSTEM CAPABLE OF AUTOMATICALLY ADJUSTING BRIGHTNESS AND ENHANCING SUBSTITUTED FEELING	
<a href="#">N8660</a>	CN	216364345	26/04/2022	QINGDAO HUWEI TECHNOLOGY	CN	24/09/2021	CN2021002326754	CN216364345U	3D HOLOGRAPHIC SOMATOSENSORY INTERACTION SYSTEM	
<a href="#">N8661</a>	CN	216362047	22/04/2022	GUANGDONG ZIJING INFORMATION STORAGE TECHNOLOGY	CN	07/09/2021	CN2021002155564	CN216362047U	RECORDING AND REPRODUCING APPARATUS FOR INCREASING HOLOGRAM RECORDING SPEED IN CROSS-SHIFT MULTIPLEXING	
<a href="#">N8662</a>	CN	216359943	22/04/2022	BEIJING LUCHENG JINXIU ENERGY TECHNOLOGY	CN	14/11/2021	CN2021002775561	CN216359943U	HOLOGRAPHIC AERIAL INTELLIGENT DISPLAY SYSTEM OF MOBILE CARRIER	
<a href="#">N8663</a>	CN	114529679	24/05/2022	TSINGHUA UNIVERSITY	CN	19/04/2022	CN2022000407271	CN114529679	METHOD AND DEVICE FOR GENERATING COMPUTED HOLOGRAPHIC FIELD BASED ON NERVE RADIATION FIELD	
<a href="#">N8664</a>	CN	114529476	24/05/2022	XIDIAN UNIVERSITY	CN	25/02/2022	CN2022000177683	CN114529476	LENSLESS HOLOGRAPHIC MICROSCOPIC IMAGING PHASE RECOVERY METHOD BASED ON DECOUPLING-FUSION NETWORK	
<a href="#">N8665</a>	CN	114494596	13/05/2022	TSINGHUA UNIVERSITY	CN	21/01/2022	CN2022000073348	CN114494596	GENERATION METHOD OF COMPUTER GENERATED HOLOGRAM AND ELECTRONIC EQUIPMENT	
<a href="#">N8666</a>	CN	114494139	13/05/2022	XIDIAN UNIVERSITY	CN	28/12/2021	CN2021001624835	CN114494139	CHIP APPEARANCE DEFECT DETECTION METHOD BASED ON LASER HOLOGRAPHIC IMAGING TECHNOLOGY	
<a href="#">N8667</a>	CN	114488523	13/05/2022	SOUTHEAST UNIVERSITY	CN	28/01/2022	CN2022000110007	CN114488523	OPTICAL DISPLAY SYSTEM AND METHOD FOR EXPANDING HOLOGRAPHIC DISPLAY EYE BOX AND FIELD ANGLE	
<a href="#">N8668</a>	CN	114486194	13/05/2022	CHANGCHUN INSTITUTE OF OPTICS FINE MECHANICS & PHYSICS - CHINESE ACADEMY OF SCIENCES	CN	27/01/2022	CN2022000100913	CN114486194	VOLUME HOLOGRAPHIC GRATING DIFFRACTION WAVEFRONT MEASURING SYSTEM AND MEASURING METHOD THEREOF	
<a href="#">N8669</a>	CN	114475035	13/05/2022	ZHEJIANG YAXIN PACKAGING MAT	CN	21/01/2022	CN2022000069468	CN114475035	PRODUCTION METHOD OF HOLOGRAPHIC TRANSFER FILM FOR FRAME PAPER	
<a href="#">N8670</a>	CN	114460750	10/05/2022	ZAIXIU NETWORK TECHNOLOGY SHENZHEN	CN	10/02/2022	CN2022000125731	CN114460750	3D HOLOGRAPHIC HEAD-WEARING INTELLIGENT COMMUNICATION GLASSES EQUIPMENT AND CONTROL METHOD	
<a href="#">N8671</a>	CN	114459342	10/05/2022	SOUTH CHINA NORMAL UNIVERSITY	CN	25/01/2022	CN2022000089633	CN114459342	COAXIAL AND OFF-AXIS DIGITAL HOLOGRAPHIC SWITCHING DEVICE BASED ON PARALLEL BEAM SPLITTING PRISM	
<a href="#">N8672</a>	CN	114446205	06/05/2022	MA KAINENG   XU LIANJUN	CN	26/02/2022	CN2022000180744	CN114446205	HOLOGRAPHIC PROJECTOR	
<a href="#">N8673</a>	CN	114445563	06/05/2022	SHENZHEN BBAI INFORMATION TECHNOLOGY	CN	15/03/2022	CN2022000250048	CN114445563	3D HOLOGRAPHIC IMAGE INTERACTION METHOD, DEVICE, SYSTEM AND MEDIUM	
<a href="#">N8674</a>	CN	114442318	06/05/2022	LUMINIT	US	06/11/2020	US2020017091493	CN114442318	HEAD-MOUNTED PERSPECTIVE DISPLAY AND RECORDING SYSTEM GUIDED BY HOLOGRAPHIC SUBSTRATE AND INTELLIGENT GLASSES	
<a href="#">N8675</a>	CN	114430482	03/05/2022	SHENZHEN JIDA HEALTH MEDICAL TECHNOLOGY	CN	02/04/2022	CN2022000342565	CN114430482	HOLOGRAPHIC DIAGNOSIS SYSTEM, METHOD, COMPUTER EQUIPMENT AND STORAGE MEDIUM	
<a href="#">N8676</a>	CN	114430250	03/05/2022	NANJING SANSHOUDU CULTURE MEDIA	CN	08/02/2022	CN2022000120107	CN114430250	HOLOGRAPHIC PHOTOVOLTAIC DISPLAY DEVICE AND POWER SUPPLY CONTROL METHOD THEREOF	
<a href="#">N8677</a>	CN	114428446	03/05/2022	TCL COMMUNICATION	CN	25/01/2022	CN2022000089929	CN114428446	GRAPHIC HOLOGRAPHIC PROJECTION METHOD AND DEVICE, STORAGE MEDIUM AND TERMINAL	
<a href="#">N8678</a>	CN	114415486	29/04/2022	TIANMA	CN	25/02/2022	CN2022000179392	CN114415486	THREE-DIMENSIONAL HOLOGRAPHIC DISPLAY DEVICE	

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<a href="#">N8679</a>	CN	114397792	26/04/2022	SHENZHEN STARLINK TECHNOLOGY	CN	03/03/2022	CN2022000203945	CN114397792	PORTABLE HOLOGRAPHIC PROJECTION IMAGING DISPLAY	
<a href="#">N8680</a>	CN	114392144	26/04/2022	MODI TECHNOLOGY JIANGSU	CN	28/12/2021	CN2021001624241	CN114392144	HEAD-WEARING EYE HOLOGRAPHIC VISION INSTRUMENT WITH HIGH COMFORT	
<a href="#">N8681</a>	CN	114391869	26/04/2022	SICHUAN PROVINCIAL HOSPITAL FOR WOMEN & CHILDREN	CN	18/01/2022	CN2022000054815	CN114391869	HOLOGRAPHIC IMAGE ULTRASONIC DIAGNOSIS DEVICE	
<a href="#">N8682</a>	CN	114387395	22/04/2022	CHINA UNIVERSITY OF MINING & TECHNOLOGY	CN	11/01/2022	CN2022000029238	CN114387395	PHASE-DOUBLE RESOLUTION RATIO NETWORK-BASED QUICK HOLOGRAM GENERATION METHOD	