

[SS 18] security and article and microlenses and angle

Results in EPODOC 0

[SS 19] security and article and microlenses

Results in EPODOC 4

[SS 20] ..li



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PN - [US5254390](#) A 19931019

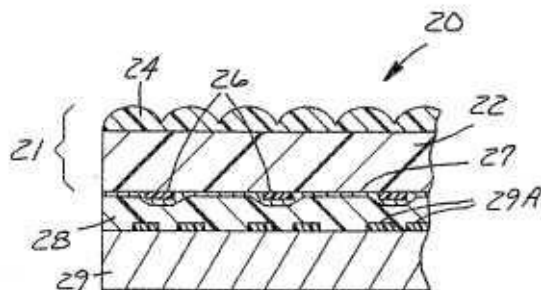
PNFP - US5254390 B1 19990518

PR - US19900613136 19901115

AP - US19900613136 19901115

DT - **

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US2444356 A 19480629 [] (LUCE
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US2951419 A 19600906 []
] (LEMELSON JEROME H);
US3332775 A 19670725 []
] (INTERDIA G M B H);
US3503315 A 19700331 [] (LUCAS
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US3689346 A 19720905 []
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] (MINNESOTA MINING & MFG);
US4414316 A 19831108 []
] (REXHAM CORP [US]);
US4420502 A 19831213 [] (CONLEY
KENNETH E);
US4505966 A 19850319 [] (TEIJIN
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US4576850 A 19860318 []
] (MINNESOTA MINING & MFG
[US]);
US4688894 A 19870825 []
] (MINNESOTA MINING & MFG
[US]);



	US4691993 A 19870908 [] (MINNESOTA MINING & MFG [US]); US4869946 A 19890926 [] (NIMSLO CORP [US])
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CCA	- B29C33/3878 ; B29K2067/00 ; B29C2035/0827 ; B32B2429/00 ; Y10S428/906 ; Y10T428/24372 ; Y10T428/24413 ; Y10T428/24479 ; Y10T428/24521 ; Y10T428/24537 ; Y10T428/24545 ; Y10T428/2457 ; Y10T428/24579 ; Y10T428/24612 ; Y10T428/24802 ; Y10T428/24851 ; Y10T428/24893 ; Y10T428/24917 ; Y10T428/24967 ; Y10T428/2804 ; Y10T428/2848
PA	- (A B1) MINNESOTA MINING & MFG [US]
TI	- (A B1) Plano-convex base sheet for retroreflective articles
AB	- (A) An article comprising a transparent plano-convex base sheet having first and second broad faces, the second face being substantially planar and the first face having an array of substantially hemi-spheroidal microlenses thereon, the shape of the microlenses and thickness of the base sheet being such that collimated light substantially orthogonally incident to the array is focused approximately at the second face. The article optionally further comprising a specularly reflective layer on the second face which renders the base sheet retroreflective. An optional layer of adhesive over the reflective layer permits the article to be adhered to a document as a tamper-indicating, authenticating, and protective overlay. Special images can be formed within the article to enhance the security provided thereby. Also, a method for forming such articles.

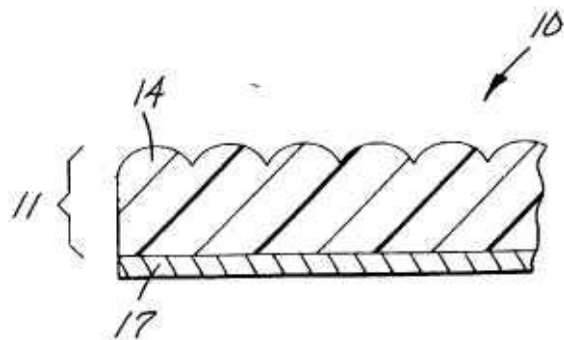
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PR - US19950559529
19951117; US19930099184
19930729; US19900613136 19901115

AP - US19950559529 19951117

DT - **

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[US1824353](#) A 19310922 [] (JONAS
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[US2444356](#) A 19480629 [] (LUCE
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[US2713004](#) A 19550712 [] (MEARL
CORP);
[US2951419](#) A 19600906 []
] (LEMELSON JEROME H);
[US3071482](#) A 19630101 []
] (FRANCIS EARLE LAB INC);
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[US3332775](#) A 19670725 []
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[US3919031](#) A 19751111 [] (ROHM
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[US3961956](#) A 19760608 [] (FUJI
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] (SWAROVSKI & CO);
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] (MINNESOTA MINING & MFG
[US]);
[US4688894](#) A 19870825 []
] (MINNESOTA MINING & MFG



	[US]); US4691993 A 19870908 [] (MINNESOTA MINING & MFG [US]); US4763985 A 19880816 [] (MINNESOTA MINING & MFG [US]); US4869946 A 19890926 [] (NIMSLO CORP [US]); US5169707 A 19921208 [] (MINNESOTA MINING & MFG [US]); US5254390 A 19931019 [] (MINNESOTA MINING & MFG [US]); GB1303103 A 19730117 []; WO9208998 A1 19920529 [] (MINNESOTA MINING & MFG [US])
CCI	- B29D11/00278 ; B29D11/00605 ; B29C33/424 ; B29C35/08 ; B29C41/22 ; B32B38/14 ; G02B3/0031 ; G02B3/0043 ; G02B3/0056 ; G02B5/126
CCA	- B29C33/3878 ; B29K2067/00 ; B29C2035/0827 ; B32B2429/00 ; Y10S428/906 ; Y10T428/24372 ; Y10T428/24413 ; Y10T428/24479 ; Y10T428/24521 ; Y10T428/24537 ; Y10T428/24545 ; Y10T428/2457 ; Y10T428/24579 ; Y10T428/24612 ; Y10T428/24802 ; Y10T428/24851 ; Y10T428/24893 ; Y10T428/24917 ; Y10T428/24967 ; Y10T428/2804 ; Y10T428/2848
PA	- MINNESOTA MINING & MFG [US]
TI	- Retroreflective article comprising a transparent base sheet and nacreous pigment coating, method for making such a base sheet, and method for making a forming master
AB	- A retroreflective article comprising a transparent base sheet having first and second broad faces, the second face being substantially planar and the first face having an array of substantially hemi-spheroidal microlenses thereon, the microlenses being wider and shorter than portions of true spheres, the shape of the microlenses and thickness of the base sheet being such that collimated light substantially orthogonally incident to the array is focused approximately at the second face, wherein the second face has a coating of a nacreous pigment composition thereon. The article can include an optional layer of adhesive over

the reflective layer to permit the **article** to be adhered to a document as a tamper-indicating, authenticating, and protective overlay. Special images can be formed within the **article** to enhance the **security** provided thereby. Also, a method for making such base sheets, and a method for making a forming master.

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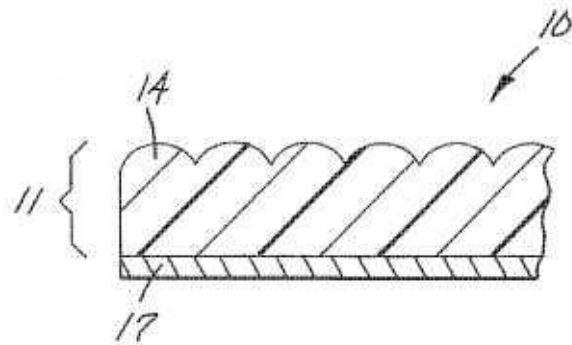
PN - [US5468540](#) A 19951121

PR - US19930099184
19930729; US19900613136 19901115

AP - US19930099184 19930729

DT - **

CT - || STSE (A)
[UST9870031](#) I4 19791002 [];
[US2444356](#) A 19480629 [] (LUCE RICHARD W);
[US2713004](#) A 19550712 [] (MEARL CORP);
[US2951419](#) A 19600906 [] (LEMELSON JEROME H);
[US3071482](#) A 19630101 [] (FRANCIS EARLE LAB INC);
[US3123490](#) A 19640303 [];
[US3332775](#) A 19670725 [] (INTERDIA G M B H);
[US3503315](#) A 19700331 [] (LUCAS INDUSTRIES LTD);
[US3689346](#) A 19720905 [] (ROWLAND DEV CORP);
[US3700305](#) A 19721024 [] (MINNESOTA MINING & MFG);
[US3801183](#) A 19740402 [] (MINNESOTA MINING & MFG);
[US3832038](#) A 19740827 [] (MINNESOTA MINING & MFG);
[US3919031](#) A 19751111 [] (ROHM & HAAS);
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[US3963309](#) A 19760615 [] (SWAROVSKI & CO);
[US4025674](#) A 19770524 [] (SEIBU POLYMER KASEI KK);
[US4099838](#) A 19780711 [] (MINNESOTA MINING & MFG);
[US4127693](#) A 19781128 [] (LEMELSON JEROME H);
[US4151666](#) A 19790501 [] (POLAROID CORP [US]);
[US4340301](#) A 19820720 [] (SWAROVSKI & CO);
[US4374077](#) A 19830215 [] (MINNESOTA MINING & MFG);
[US4414316](#) A 19831108 [] (REXHAM CORP [US]);
[US4420502](#) A 19831213 [] (CONLEY



	KENNETH E); US4428997 A 19840131 [] (POLAROID CORP [US]); US4505967 A 19850319 [] (MINNESOTA MINING & MFG [US]); US4576850 A 19860318 [] (MINNESOTA MINING & MFG [US]); US4688894 A 19870825 [] (MINNESOTA MINING & MFG [US]); US4691993 A 19870908 [] (MINNESOTA MINING & MFG [US]); US4763985 A 19880816 [] (MINNESOTA MINING & MFG [US]); US4869946 A 19890926 [] (NIMSLO CORP [US]); US5169707 A 19921208 [] (MINNESOTA MINING & MFG [US]); US5254390 A 19931019 [] (MINNESOTA MINING & MFG [US]); GB1303103 A 19730117 []; WO9208998 A1 19920529 [] (MINNESOTA MINING & MFG [US])
CCI	- B29D11/00278 ; B29D11/00605 ; B29C33/424 ; B29C35/08 ; B29C41/22 ; B32B38/14 ; G02B3/0031 ; G02B3/0043 ; G02B3/0056 ; G02B5/126
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PA	- MINNESOTA MINING & MFG [US]
TI	- Retroreflective article comprising a transparent base sheet and nacreous pigment coating, method for making such a base sheet, and method for making a forming master
AB	- A retroreflective article comprising a transparent base sheet having first and second broad faces, the second face being substantially planar and the first face having an array of substantially hemi-spheroidal microlenses thereon, the microlenses being wider and shorter than portions of true

spheres, the shape of the **microlenses** and thickness of the base sheet being such that collimated light substantially orthogonally incident to the array is focused approximately at the second face, wherein the second face has a coating of a nacreous pigment composition thereon. The **article** can include an optional layer of adhesive over the reflective layer to permit the **article** to be adhered to a document as a tamper-indicating, authenticating, and protective overlay. Special images can be formed within the **article** to enhance the **security** provided thereby. Also, a method for making such base sheets, and a method for making a forming master.

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- PN - [CA2092816](#) A1 19920516
- PNFP - CA2092816 C 20020423
- PR - US19900613136 19901115; WO1991US07408 19911007
- AP - CA19912092816 19911007
- DT - I
- CCI - [B29D11/00278](#) ; [B29D11/00605](#) ; [B29C33/424](#) ; [B29C35/08](#) ; [B29C41/22](#) ; [B32B38/14](#) ; [G02B3/0031](#) ; [G02B3/0043](#) ; [G02B3/0056](#) ; [G02B5/126](#)
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- PA - (A1)
MINNESOTA MINING & MFG [US]
- TI - (A1 C)
PLANO-CONVEX BASE SHEET FOR RETROREFLECTIVE ARTICLES AND METHOD FOR MAKING SAME
- AB - (A1)
2092816 9208998 PCTABS00013 An **article** comprising a transparent plano-convex base sheet having first and second broad faces, the second face being substantially planar and the first face having an array of substantially hemi-spheroidal **microlenses** thereon, the shape of the **microlenses** and thickness of the base sheet being such that collimated light substantially orthogonally incident to the array is focused approximately at the second face. The **article** optionally further comprising a specularly reflective layer on the second face which renders the base sheet retroreflective. An optional layer of adhesive over the reflective layer permits the **article** to be adhered to a document as a tamper-indicating, authenticating, and protective overlay. Special images can be formed within the **article** to enhance the **security** provided thereby. Also, a method for forming such articles.
- An **article** comprising a transparent piano-convex base sheet having first and second broad faces, the second face being substantially planar and the first face having an array of substantially hemi-spheroidal **microlenses** thereon, the shape of the microlenses and thickness of the base sheet being such that collimated light substantially orthogonally incident to the array is focused approximately at the second face. The **article** optionally further comprising a specularly reflective layer on the second face which renders the base sheet retroreflective. An optional layer of adhesive over the reflective layer permits the **article** to be adhered to a document as a tamper-indicating, authenticating, and protective overlay. Special images can be formed within the **article**

to enhance the **security** provided thereby. Also, a method for forming such **article s**.

- (C)

An **article** comprising a transparent piano-convex base sheet having first and second broad faces, the second face being substantially planar and the first face having an array of substantially hem i- spheroidal **microlenses** thereon, the shape of the microlenses and thickness of the base sheet being such that collimated light substantially orthogonally incident to the array is focused approximately at the second face. The **article** optionally further comprising a specularly reflective layer on the second face which renders the base sheet retroreflective. An optional layer of adhesive over t he reflective layer permits the **article** to be adhered to a document as a tamper-indicating, authenticating, and protective overlay. Special images can be formed within the **article** to enhance the **security** provided thereby. Also, a method for forming such **article s**.

[SS 20] security and microspheres and composite and image

Results in EPODOC 0

[SS 21] microlenses and composite and image

Results in EPODOC 73

[SS 22] ..li

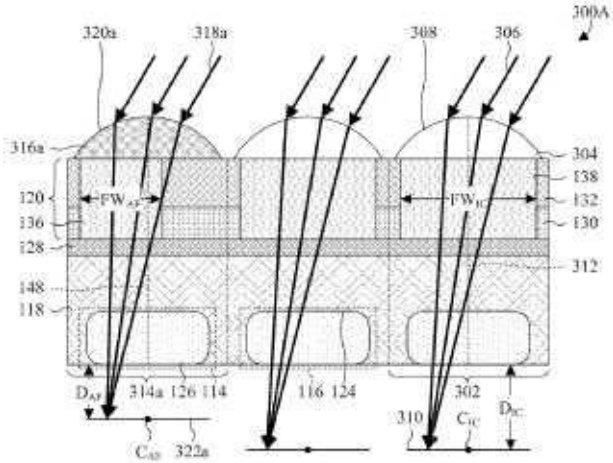


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- PN - [CN107888837](#) A 20180406
- PR - JP20120041433 20120228; CN2013810817 20130225
- AP - CN201711407173 20130225
- DT - I
- CCI - [G06T3/4015](#) ; [G06T5/004](#) ; [H04N5/23212](#) ; [H04N5/23235](#)
- CUI - [G02B3/0056](#) ; [G02B26/08](#)
- CNOI - [G06T3/4015](#) ; [G06T5/004](#) ; [H04N5/23212](#) ; [H04N5/23235](#)
- CCA - [G06T2207/10052](#)
- CNOA - [G06T2207/10052](#)
- PA - NIKON CORP
- TI - **Image** processing apparatus
- AB - The invention relates to an **image** processing apparatus. The **image** processing apparatus includes a plurality of **microlenses** arranged two-dimensionally so that the object light transmitted through an **image** forming optical system impinges thereon, a plurality of light-receiving elements arranged near the focal position on the rear side of the **microlenses** corresponding to the plurality of **microlenses**, respectively, and receiving the object light transmitted through the **microlenses**, **image** composition means capable of compounding images of a focal surface different from a planned focal surface of the **image** forming optical system, based on the outputs from the plurality of light-receiving elements, and processing means for performing **image** processing on a second **composite image** compounded by the **image** composition means as an **image** corresponding to a focal plane of a position a first distance away from the top point of the **microlenses** by using a first **composite image** of an **image** corresponding to the focal plane of a position a first distance away from the top point of the **microlenses** and compound by the **image** composition means.

2/73 © EPODOC / EPO

PN - [TW201719875](#) A 20170601
 PR - US201514855429 20150916
 AP - TW20160129272 20160909
 DT - |
 CCI - [H01L27/14605](#) ; [H01L27/14627](#) ;
 [H04N5/23212](#) ; [H04N5/3696](#)
 CQI - [H01L27/14607](#) ; [H01L27/14645](#) ;
 [H01L27/14685](#)
 CCA - [H01L27/14621](#) ; [H01L27/14636](#) ;
 [H01L27/1464](#) ; [H01L27/14698](#)
 PA - TAIWAN SEMICONDUCTOR MFG CO
 LTD [TW]
 TI - A microlens for a phase
 detection auto focus (PDAF) pixel
 of a **composite** grid structure and
 method for forming the same
 AB - An **image** sensor for high angular
 response discrimination is
 provided. A plurality of pixels
 comprises a phase detection
 autofocus (PDAF) pixel and
 an **image** capture pixel. Pixel
 sensors of the pixels are
 arranged in a semiconductor
 substrate. A grid structure is
 arranged over the semiconductor
 substrate, laterally surrounding
 color filters of the
 pixels. **Microlenses** of the pixels
 are arranged over the grid
 structure, and comprise a PDAF
 microlens of the PDAF pixel and
 an **image** capture microlens of
 the **image** capture pixel. The PDAF
 microlens comprises a larger
 optical power than the **image**
 capture microlens, or comprises
 a location or shape so a PDAF
 receiving surface of the PDAF
 pixel has an asymmetric profile.
 A method for manufacturing
 the **image** sensor is also
 provided.



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 PN - [EP3260893](#) A2 20171227
 PNFP - EP3260893 A3 20180411
 PR - US20070990446P
 20071127; EP20080854366 20081110
 AP - EP20170171753 20081110
 DT - **
 CT - || STSE (A3)
 [WO2007047259](#) A1 20070426
 [IY] (3M INNOVATIVE PROPERTIES
 CO [US])
 [I] 3,4
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 [Y] 1;
 [WO2006106147](#) A1 20061012
 [Y] (UPSTREAM ENGINEERING OY

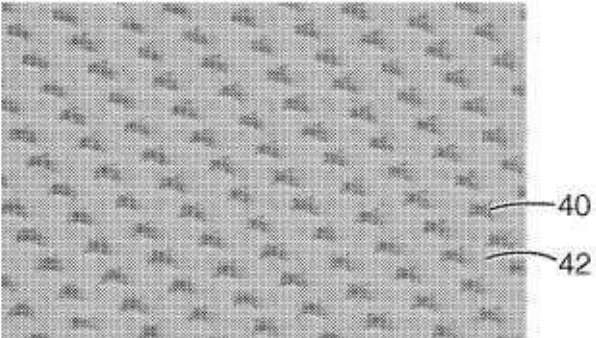


Fig. 4

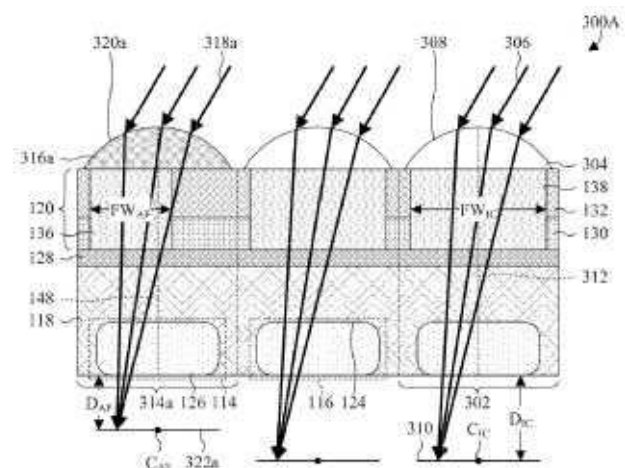
	[FI], et al) [Y] 1,2 * paragraph [0045] *; WO9208998 A1 19920529 [Y] (MINNESOTA MINING & MFG [US]) [Y] 2 * page 3, line 28 - page 4, line 4 *; WO0163341 A1 20010830 [Y] (3M INNOVATIVE PROPERTIES CO [US]) [Y] 2 * page 7, line 25 - page 8, line 19 * * page 10, line 24 - page 11, line 16 *; US2004012872 A1 20040122 [A] (FLEMING PATRICK R [US], et al) [A] 1,2 * paragraph [0002] *; WO2006130995 A2 20061214 [A] (UNIV MCGILL [CA], et al) [A] 1 * abstract *; WO03005075 A1 20030116 [A] (3M INNOVATIVE PROPERTIES CO [US]) [A] 1-4 * the whole document *
CCI	- B29D11/00365 ; G02B3/0031 ; G02B3/0056 ; G02B27/2292
PA	- (A2 A3) 3M INNOVATIVE PROPERTIES CO [US]
TI	- (A2 A3) METHODS FOR FORMING SHEETING WITH A COMPOSITE IMAGE THAT FLOATS AND A MASTER TOOLING
AB	- (A2) A master tool and a method of using a master tool for forming a sheeting are described where the sheeting has a composite image that floats above or below the sheeting. The master tool includes a first sheeting have a first array of microlenses and a photopolymerized first material layer adjacent to the first array of microlenses . The photopolymerized material is polymerized upon exposure to conditions resulting in simultaneous absorption of two or more photons. The first sheeting includes polymerized structured areas in the first material layer. At least some of the structured areas have a portion shape in common with at least some of the other structured areas and each

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PN	- JP2017063244 A 20170330
PR	- JP20150186213 20150924
AP	- JP20150186213 20150924
DT	- I
FI	- H04N13/00&550; H04N13/00&590; H04N13/189; H04N13/194; H04N5/225; H04N5/225&F; H04N5/225&Z; H04N5/225&300; H04N5/232&300; H04N5/76; H04N5/76&Z; H04N5/765; H04N5/91; H04N5/91&J; H04N5/91&L; H04N5/92; H04N5/92&C
FT	- 5C053/FA07; 5C053/GA06; 5C053/GB36; 5C053/LA02; 5C053/LA14; 5C061/AB02; 5C061/AB10; 5C061/AB21; 5C122/DA04; 5C122/EA68; 5C122/FA04; 5C122/FB05; 5C122/FG15; 5C122/FH07; 5C122/FK12; 5C122/GA20; 5C122/GA34; 5C122/GC07; 5C122/GC36; 5C122/GC54; 5C122/HA09; 5C122/HB01
PA	- CANON KK
TI	- IMAGING APPARATUS
AB	- PROBLEM TO BE SOLVED: To solve the problem in which when a left-eye image and a right-eye image photographed by an imaging element which has a plurality of microlenses formed on a solid-state imaging element and also has pairs of photodiodes closely to the respective microlenses are transferred to external equipment, it takes a time to display an image at an outside output destination.SOLUTION: An imaging apparatus comprises:an image element which has a plurality of photoelectric conversion regions arranged at pixels having microlenses ; an image composition device which generates a left-eye image , a right-eye image , and a composite image from an image signal output from the imaging element; determination means of determining whether external equipment connected to the imaging apparatus by wire or wireless can make a 3D display; recording means of recording the photographed left-eye image , right-eye image , and composite image in file information during the photography; recording means of recording a left-eye thumbnail and a right-eye thumbnail in the file information; and means capable of changing the order of the recorded file information to be transmitted when receiving an acquisition request from the external equipment.SELECTED DRAWING: Figure 1

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PN	- CN106549025 A 20170329
PR	- US201514855429 20150916
AP	- CN20161084478 20160214
DT	- I
CCI	- H01L27/14627 ; H01L27/14605 ; H04N5/23212 ; H04N5/3696
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CNOI	- H01L27/14627 ; H01L27/14685
CCA	- H01L27/14621 ; H01L27/14636 ; H01L27/1464 ; H01L27/14698
PA	- TAIWAN SEMICONDUCTOR MFG CO LTD
TI	- Microlens for a phase detection auto focus (PHAF) pixel of a composite grid structure
AB	- An image sensor for high angular response discrimination is provided. A plurality of pixels comprises a phase detection autofocus (PDAF) pixel and an image capture pixel. Pixel sensors of the pixels are



arranged in a semiconductor substrate. A grid structure is arranged over the semiconductor substrate, laterally surrounding color filters of the pixels. **Microlenses** of the pixels are arranged over the grid structure, and comprise a PDAF microlens of the PDAF pixel and an **image** capture microlens of the **image** capture pixel. The PDAF microlens comprises a larger optical power than the **image** capture microlens, or comprises a location or shape so a PDAF receiving surface of the PDAF pixel has an asymmetric profile. A method for manufacturing the **image** sensor is also provided.

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PN - [US2017077163](#) A1 20170316

PNFP - US10002899 B2 20180619

PR - US201514855429 20150916

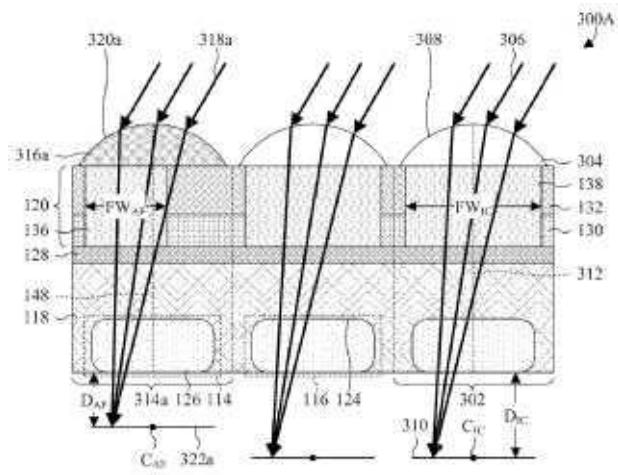
AP - US201514855429 20150916

DT - *: Rep

CT - || R141 (A1)
[US2003000644](#) A1 20030102 [] (SUBRAMANIAN RAMKUMAR [US], et al);
[US2007238034](#) A1 20071011 [] (HOLSCHER RICHARD D JR [US]);
[US2014313379](#) A1 20141023 [] (MACKEY JEFFREY [US])

- || STSE (B2)
[US2003000644](#) A1 20030102 [] (SUBRAMANIAN RAMKUMAR [US], et al);
[US2007238034](#) A1 20071011 [] (HOLSCHER RICHARD D JR [US]);
[US2009122171](#) A1 20090514 [] (SUZUKI SATOSHI [JP]);
[US2014176780](#) A1 20140626 [] (KOSHIBA MASAOKI [JP]);
[US2014225215](#) A1 20140814 [] (CHIEN VOLUME [TW], et al);
[US2014313379](#) A1 20141023 [] (MACKEY JEFFREY [US]);
[US2015035104](#) A1 20150205 [] (HORIYOSHI HIROSHI [JP]);
[US2015062390](#) A1 20150305 [] (KIM HO SOO [KR], et al);
[US2015076643](#) A1 20150319 [] (KIKUCHI KOJI [JP]);
[US2015102442](#) A1 20150416 [] (OOTSUKA YOICHI [JP]);
[US2015195466](#) A1 20150709 [] (TAKASE MASAYUKI [JP], et al);
[US2016276396](#) A1 20160922 [] (TAYANAKA HIROSHI [JP], et al)

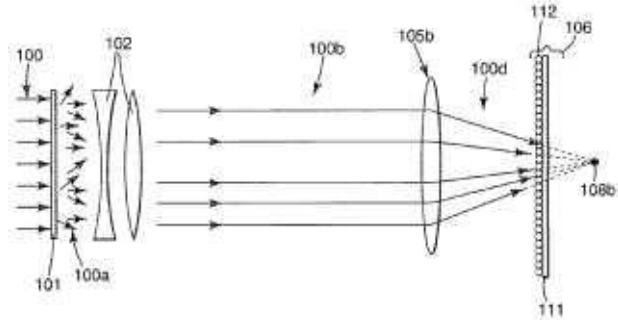
CCI - [H01L27/14627](#) ; [H01L27/14605](#) ;



	H04N5/23212 ; H04N5/3696
CQI	- H01L27/14607 ; H01L27/14645 ; H01L27/14685
CCA	- H01L27/14621 ; H01L27/14636 ; H01L27/1464 ; H01L27/14698
PA	- (A1) TAIWAN SEMICONDUCTOR MANUFACTURING CO LTD [TW] - (B2) TAIWAN SEMICONDUCTOR MFG CO LTD [TW]
TI	- (A1) MICROLENS FOR A PHASE DETECTION AUTO FOCUS (PHAF) PIXEL OF A COMPOSITE GRID STRUCTURE - (B2) Microlens for a phase detection auto focus (PDAF) pixel of a composite grid structure
AB	- (A1 B2) An image sensor for high angular response discrimination is provided. A plurality of pixels comprises a phase detection autofocus (PDAF) pixel and an image capture pixel. Pixel sensors of the pixels are arranged in a semiconductor substrate. A grid structure is arranged over the semiconductor substrate, laterally surrounding color filters of the pixels. Microlenses of the pixels are arranged over the grid structure, and comprise a PDAF microlens of the PDAF pixel and an image capture microlens of the image capture pixel. The PDAF microlens comprises a larger optical power than the image capture microlens, or comprises a location or shape so a PDAF receiving surface of the PDAF pixel has an asymmetric profile. A method for manufacturing the image sensor is also provided.

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PN	- TW200745625 A 20071216
PR	- US20060399695 20060406
AP	- TW20070112140 20070404
DT	- I
CCI	- B44F1/10 ; G02B3/0006 ; G02B5/128 ; G02B27/2214 ; G02B27/2292
PA	- 3M INNOVATIVE PROPERTIES CO [US]
TI	- Sheetting with composite image



that floats

AB - Translucent, transparent, or semi-translucent microlens sheetings with **composite** images are disclosed, in which a **composite image** floats above or below the sheeting, or both. The **composite image** may be two-dimensional or three-dimensional. The sheeting may have at least one layer of material having a surface of **microlenses** that form one or more images at positions internal to the layer of material, at least one of the images being a partially complete **image**. Additional layers, such as retroreflective, translucent, transparent, or optical structure layers may also be incorporated into the sheeting.

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PN - [EP3168659](#) A1 20170517

PR - US20060399695
20060406; EP20070797192 20070402

AP - EP20160193338 20070402

DT - **

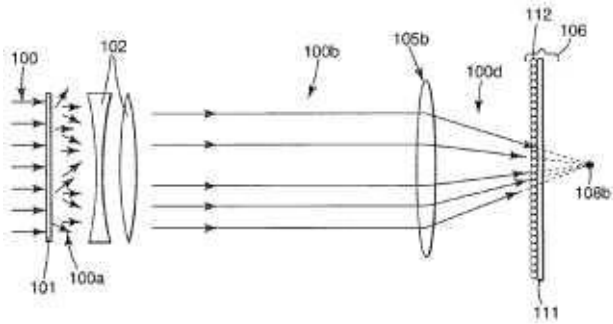
CT - || STSE (A1)
[WO0163341](#) A1 20010830 [A] (3M INNOVATIVE PROPERTIES CO [US]) [A] 1-14
* pages 6-8,19 - page 22; figures 3,4,14,15 *;
[WO2005052650](#) A2 20050609 [A] (NANOVENTIONS INC [US], et al) [A] 1-14
* figures 6a-6c,9,10,15a-15d,18a-18f,23,33 *
* page 6, lines 8-19 *
* page 29, line 17 - page 30, line 16 *
* page 31, line 21 - page 33, line 13 *
* page 58, lines 21-23 *;
[WO0240291](#) A2 20020523 [A] (TAYLOR CORP [US], et al) [A] 1-14
* page 15, lines 3-16; figure 3 *

CCI - [B44F1/10](#) ; [G02B3/0006](#) ;
[G02B5/128](#) ; [G02B27/2214](#) ;
[G02B27/2292](#)

PA - 3M INNOVATIVE PROPERTIES CO [US]

TI - SHEETING WITH **COMPOSITE IMAGE** THAT FLOATS

AB - The present application relates to a sheeting comprising a layer of translucent, radiation-sensitive material having on a



first surface hemi-spheroidal or hemi-aspheroidal **microlenses** and comprising one or more images at positions internal to the layer of material, wherein at least one of the images is a partially complete **image**, and each of the images is associated with a different one of the **microlenses**, and wherein the **microlenses** have refractive surfaces that transmit light to positions within the layer of material to produce a **composite image** from the images from the partially complete **image** formed within the layer of material so that the **composite image** appears to float above the sheeting, float below the sheeting, or float in the plane of the sheeting.

9/73 © EPODOC / EPO

PN - [US2015140292](#) A1 20150521

PNFP - US9289962 B2 20160322

PR - US201214118592
20120516; US201161488205P
20110520; WO2012US38026
20120516

AP - US201214118592 20120516

DT - **

CT - || R141 (A1)
[US2005180020](#) A1 20050818 [
] (STEENBLIK RICHARD A [US], et
al)
- || STSE (B2)
[US2005180020](#) A1 20050818 [
] (STEENBLIK RICHARD A [US], et
al)

CCI - [B42D25/41](#) ; [B42D25/29](#) ;
[B42D25/47](#)

CUI - [B32B7/12](#) ; [B32B37/18](#) ; [B32B3/10](#)

CCA - [B42D2033/04](#) ; [B42D2033/24](#) ;
[B42D2033/30](#) ; [B42D2035/20](#) ;
[B42D2035/36](#) ; [B42D2035/50](#) ;
[B42D25/324](#) ; [Y10T156/10](#) ;
[Y10T428/24868](#)

CUA - [B32B2255/26](#) ; [B32B2307/412](#) ;
[B32B2554/00](#)

PA - (A1)
FILIATRAULT BARBARA J [US]
- (B2)
CHEN-HO KUI [US]; HAAS
CHRISTOPHER K [US]; DUNN
DOUGLAS S [US]; FANSLER DUANE
D [US]; XIA JIANHUI [US]; ZHU
DONG-WEI [US]; FILIATRAULT
TIMOTHY D [US]; FILIATRAULT
BARBARA J [US]; OLSON DAVID B
[US]; LARSON RANDY A [US];
ZHANG JUN-YING [US]; HAO ENCAI

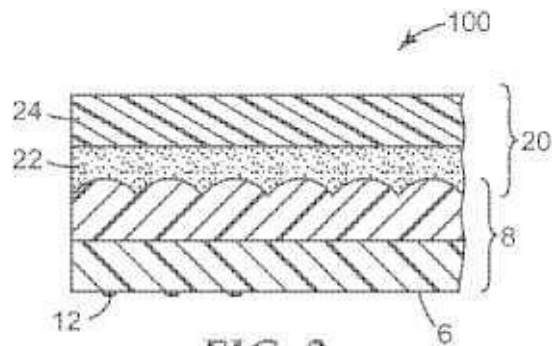


FIG. 3

	[US]; 3M INNOVATIVE PROPERTIES CO [US]
TI	- (A1) LASER-PERSONALIZABLE SECURITY ARTICLES - (B2) Laser-personalizable security articles
AB	- (A1) Laser-personalizable security articles include a multi-layer security document and an optically transparent processing tape. The multi-layer security document includes an optically transparent cover layer, a composite image and an imagable layer adjacent to the cover layer. The first surface of the cover layer is at least partially a microstructured surface, where the microstructured surface forms microlenses or a lenticular surface. The composite image is made by a collection of complete or partial images viewed through the microstructured surface of the cover layer. The composite image is located on or within the second surface of the cover layer. The imagable layer is a laser imagable layer. The optically transparent processing tape sufficiently wets out on the microstrucured surface to render the microstructured surface invisible to a writing laser. - (B2) Laser-personalizable security articles include a multi-layer security document and an optically transparent processing tape. The multi-layer security document includes an optically transparent cover layer, a composite image and an imagable layer adjacent to the cover layer. The first surface of the cover layer is at least partially a microstructured surface, where the microstructured surface forms microlenses or a lenticular surface. The composite image is made by a collection of complete or partial images viewed through the microstructured surface of the cover layer. The composite image is located on or within the second surface of the cover layer. The imagable layer is a laser. The optically transparent

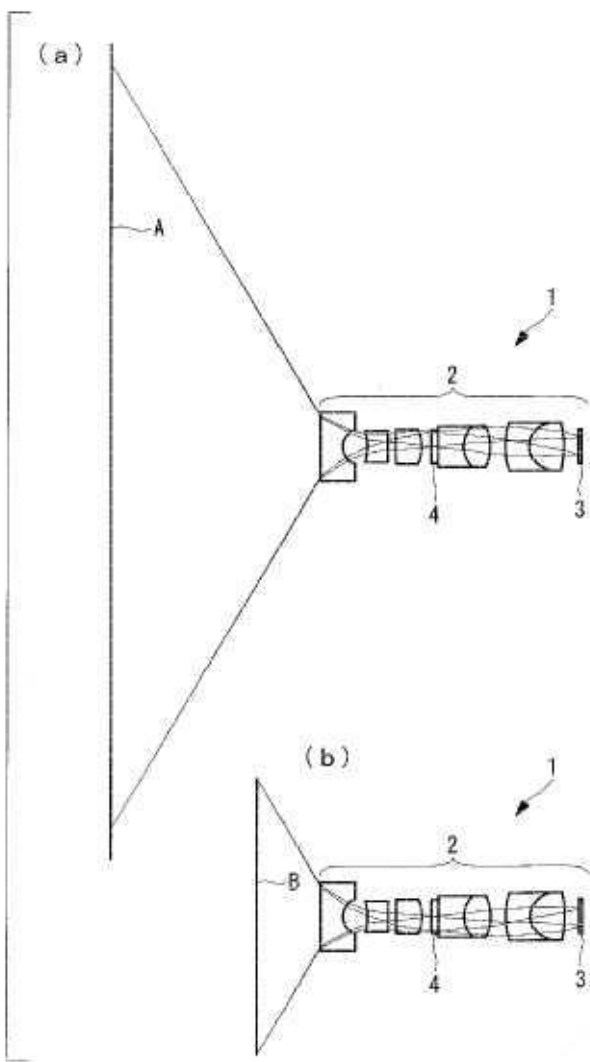
processing tape sufficiently wets
out on the misconstructured
surface to render the
microstructured surface invisible
to a writing laser.

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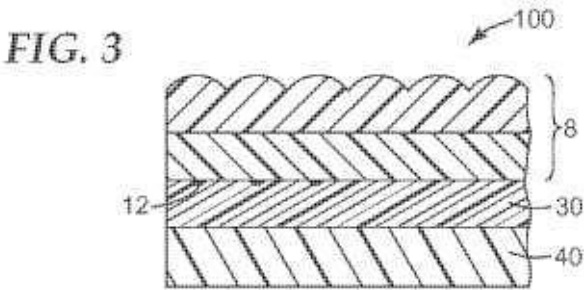
PN	- JP2015064909 A 20150409
PNFP	- JP6036799B B2 20161130
PR	- JP20140262947 20141225
AP	- JP20140262947 20141225
DT	- I
FI	- G06T1/00&420A; H04N5/225; H04N5/225&D; H04N5/232; H04N5/232&Z; H04N5/232&290; H04N5/335&430; H04N5/335&690; H04N5/343; H04N5/369
FT	- 5B047/AA07; 5B047/BA10; 5B047/BB04; 5B047/BC05; 5B047/BC06; 5B047/BC21; 5B047/BC23; 5B047/CA17; 5B047/DC20; 5C024/CX37; 5C024/EX43; 5C024/GX02; 5C024/GX22; 5C122/EA37; 5C122/FB05; 5C122/FH22
PA	- (A) NIKON CORP
TI	- (A) IMAGE PROCESSING DEVICE AND IMAGING DEVICE
AB	- (A) PROBLEM TO BE SOLVED: To make resolution of a composite image capable of setting an arbitrary focus position higher than that to be determined depending upon microlenses . SOLUTION: An imaging device comprises: a plurality of microlenses 120 that is two-dimensionally arranged in the vicinity of a focal plane of an image forming optical system; an image pickup element 13 in which an element group including a plurality of photoelectric conversion elements receiving a ray flux passing through the image forming optical system and coming from a subject via the microlens and outputting an image signal is two-dimensionally arranged corresponding to each of the microlenses ; composite means 106 and 107 for, in order to generate composite image data corresponding to a plurality of image formation regions in an arbitrary image formation plane of the image forming optical system, composing image signals output from the plurality of photoelectric conversion elements on the basis of a table identifying a location of the photoelectric conversion element outputting an image signal for use in generation of composite image data for each image formation region; and creation means 105 for creating the table for each arbitrary image formation plane.

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PN	- JP2015014686 A 20150122
PNFP	- JP5953270B B2 20160720
PR	- JP20130140821 20130704
AP	- JP20130140821 20130704
DT	- I
CCI	- H01L27/14627 ; H04N5/23229
FI	- G03B15/00&B; G03B35/08; G06T3/00&300; G06T5/50; H04N5/225&400; H04N5/232; H04N5/232&Z; H04N5/232&120; H04N5/232&290
FT	- 2H059/AA09; 5B057/BA12; 5B057/BA15; 5B057/CA01; 5B057/CA08; 5B057/CA12; 5B057/CA16; 5B057/CB01; 5B057/CB08; 5B057/CB12; 5B057/CB16; 5B057/CE06; 5B057/CE08; 5B057/CH11; 5B057/CH18; 5B057/DA07; 5B057/DA16; 5B057/DB02; 5B057/DB06; 5B057/DB09; 5B057/DC19; 5C122/DA03; 5C122/DA04; 5C122/EA37; 5C122/FB03; 5C122/FB05; 5C122/FD10; 5C122/FH04; 5C122/FH18; 5C122/FH24
PA	- (A) OLYMPUS CORP
TI	- (A) IMAGING DEVICE
AB	- (A) PROBLEM TO BE SOLVED: To generate a stable composite image from a plurality of image signals that have a parallax and are different in a focal point. SOLUTION: There is provided an imaging device 1 that comprises: an image formation optical system 2 that focuses light from a subject; an image pickup element that images the light focused by the image formation optical system 2; a microlens array that is constituted by plurally arraying microlenses arranged so as to cover a plurality of pixels of the image pickup element, respectively; and a focal distance change part 4 that is placed at a pupil position of the image formation optical system, and causes a focal distance to be spatially changed so as to cause transmission light to be focused at a plurality of different focus positions.



PN	- US2014197625 A1 20140717
PNFP	- US10017001 B2 20180710
PR	- US201214118688 20120516; US201161488206P 20110520; WO2012US38110 20120516
AP	- US201214118688 20120516
DT	- **
CT	- R141 (A1) US2008284157 A1 20081120 [] (MUKE SANI [AU], et al); US4765656 A 19880823 [] (BECKER WOLFGANG [DE], et al); US2009310470 A1 20091217 [] (YRJONEN TAPIO [FI]); US5944356 A 19990831 [] (BERGMANN MATTHIAS [DE], et al); US2003183695 A1 20031002 [] (LABREC BRIAN [US], et al); WO2010115235 A1 20101014 [] (AUSTRALIA RESERVE BANK [AU], et al); US2005109850 A1 20050526 [] (JONES ROBERT L [US]); US2010103528 A1 20100429 [] (ENDLE JAMES P [US], et al); US7728048 B2 20100601 [] (LABREC BRIAN [US]) - STSE (B2) US4765656 A 19880823 [] (BECKER WOLFGANG [DE], et al); US5944356 A 19990831 [] (BERGMANN MATTHIAS [DE], et al); US7728048 B2 20100601 [] (LABREC BRIAN [US]); US2003183695 A1 20031002 [] (LABREC BRIAN [US], et al); US2005109850 A1 20050526 [] (JONES ROBERT L [US]); US2008284157 A1 20081120 [] (MUKE SANI [AU], et al); US2009310470 A1 20091217 [] (YRJONEN TAPIO [FI]); US2010103528 A1 20100429 [] (ENDLE JAMES P [US], et al); WO2010115235 A1 20101014 [] (AUSTRALIA RESERVE BANK [AU], et al)
CCI	- B42D25/41 ; B42D25/29 ; B42D25/455 ; B42D25/46 ; G02B3/0056
CUI	- B42D25/23 ; B42D25/24 ; B42D25/285 ; B42D25/435 ; B42D25/21 ; B42D25/00
CCA	- Y10T156/10 ; B42D2033/30 ; B42D2035/34 ; B42D2035/50 ; B42D25/324
PA	- (A1) CHEN-HO KUI [US]; HAAS



CHRISTOPHER K [US]; DUNN DOUGLAS S [US]; KONG STEVEN HIN-CHUNG [US]; OLSON DAVID B [US]; LARSON RANDY A [US]; POTTS TRAVIS L [US]; 3M INNOVATIVE PROPERTIES CO [US]

- (B2)
CHEN HO KUI [US]; HAAS CHRISTOPHER K [US]; DUNN DOUGLAS S [US]; KONG STEVEN HIN CHUNG [US]; OLSON DAVID B [US]; LARSON RANDY A [US]; POTTS TRAVIS L [US]; 3M INNOVATIVE PROPERTIES CO [US]

TI - (A1)
LASER-PERSONALIZABLE SECURITY ARTICLES

- (B2)
Laser-personalizable security articles

AB - (A1 B2)
Laser-personalizable security articles include multi-layer security documents. The multi-layer security document includes an optically transparent cover layer, a **composite image** and an imagable layer adjacent to the cover layer. The first surface of the cover layer is at least partially a microstructured surface, where the microstructured surface forms **microlenses** or a lenticular surface. The **composite image** is made by a collection of complete or partial images viewed through the microstructured surface of the cover layer. The **composite image** is located on or within the second surface of the cover layer. The imagable layer is a laser imagable layer. When imaged, a personalized second **composite** three dimensional **image** is created on or in the imagable layer.

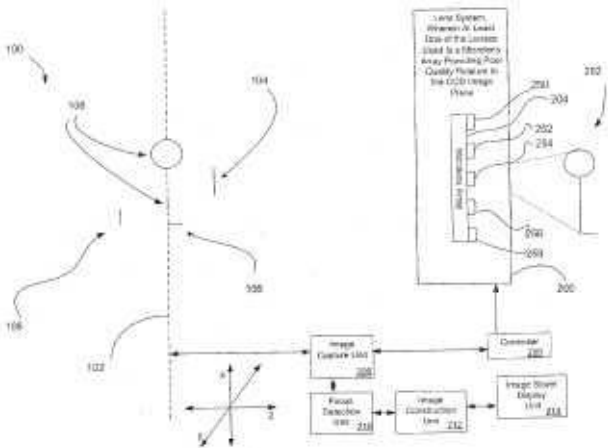
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PN - [US2014176753](#) A1 20140626

PNFP - US9348123 B2 20160524

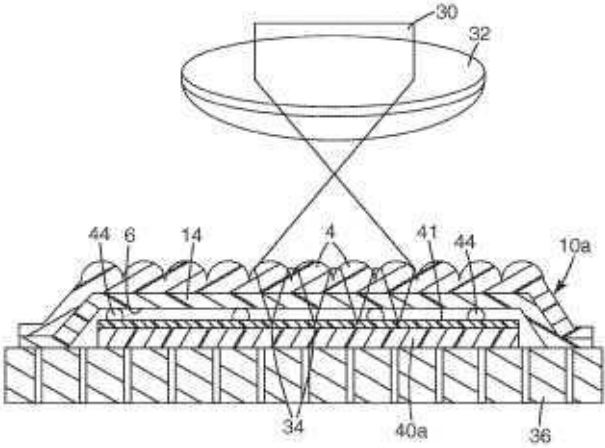
PR - US201314108003
20131216; US20100925848
20101028; US20080072497
20080225; US20070811356
20070607; US20070804314
20070515; US20060498427
20060802; US20050221350
20050907; US20040764431
20040121; US20040764340
20040121; US20030738626 20031216

AP - US201314108003 20131216



DT	- **
CT	- R141 (A1) US7259917 B2 20070821 [] (HILLIS W DANIEL [US], et al); US7417797 B2 20080826 [] (HILLIS W DANIEL [US], et al); US2002176011 A1 20021128 [] (KUWAYAMA AKIKO [JP]); US7058233 B2 20060606 [] (SILBER ANDREW DAVID [US]); US7012757 B2 20060314 [] (WALLERSTEIN EDWARD P [US], et al) - STSE (B2) US7012757 B2 20060314 [] (WALLERSTEIN EDWARD P [US], et al); US7058233 B2 20060606 [] (SILBER ANDREW DAVID [US]); US7259917 B2 20070821 [] (HILLIS W DANIEL [US], et al); US7417797 B2 20080826 [] (HILLIS W DANIEL [US], et al); US2002176011 A1 20021128 [] (KUWAYAMA AKIKO [JP])
CCI	- G02B27/0075 ; G02B7/365 ; G02B27/40 ; G06T5/50 ; H04N5/23212 ; H04N5/23232 ; H04N5/3572
CCA	- G02B7/023 ; G02B15/14 ; G02B3/0006 ; G06T2207/20221
PA	- (A1) SEARETE LLC [US] - (B2) SEARETE LLC [US]; INVENTION SCIENCE FUND I LLC [US]
TI	- (A1) Image Correction Using Individual Manipulation of Microlenses in a Microlens Array - (B2) Image correction using individual manipulation of microlenses in a microlens array
AB	- (A1 B2) A system constructs a composite image using focus assessment information of image regions.

PN	- JP2014089726 A 20140515
PR	- US20060566578 20061204
AP	- JP20130252938 20131206
DT	- I
CCI	- G02B27/2214
CCA	- G02B5/128
FI	- G02B27/22; G03B35/00&A; G06F3/048&651B; G06F3/048&654D; G06F3/048&656B; G06F3/0481&150; G06F3/0484&120; G06F3/0487
FT	- 2H059/AA24; 2H059/AA35; 2H059/AB01; 2H059/AB04; 2H199/BA32; 2H199/BA55; 2H199/BB03; 2H199/BB20; 5E555/AA27; 5E555/BA23; 5E555/BA81; 5E555/BB23; 5E555/BC01; 5E555/BE16; 5E555/CA29; 5E555/DA11; 5E555/FA07
PA	- 3M INNOVATIVE PROPERTIES CO
TI	- USER INTERFACE INCLUDING COMPOSITE IMAGES THAT FLOAT
AB	- PROBLEM TO BE SOLVED: To provide a user interface that includes one or more composite images that are perceived by an observer to be suspended in space.SOLUTION: A user interface comprises: a sheet, comprising at least one layer of microlenses that has first and second sides, a layer of material disposed adjacently to the first side of the layer of microlenses , and an at least partially complete image formed in the material associated with each of a plurality of the microlenses , where the image contrasts with the material; a first composite image , provided by the individual images, that appears to an unaided eye to float at a first distance above the sheet; and a second composite image , provided by the individual images, that appears to an unaided eye to float at a second distance above the sheet. The first and second distances are approximately equal. The first and second composite images are related to the same task or mental operation.



PN - [CA2845227](#) A1 20071011

PNFP - CA2845227 C 20150127

PR - US20060399695
20060406; CA20072645573 20070402

AP - CA20072845227 20070402

DT - I

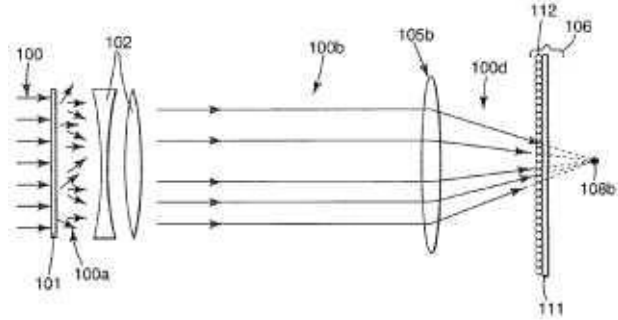
CCI - [B44F1/10](#) ; [G02B3/0006](#) ;
[G02B5/128](#) ; [G02B27/2214](#) ;
[G02B27/2292](#)

PA - (A1 C)
3M INNOVATIVE PROPERTIES CO
[US]

TI - (A1 C)
SHEETING WITH **COMPOSITE**
IMAGE THAT FLOATS

AB - (A1)
Translucent, transparent, or semi-translucent microlens sheetings with **composite** images are disclosed, in which a **composite image** floats above or below the sheeting, or both. The **composite image** may be two-dimensional or three-dimensional. The sheeting may have at least one layer of material having a surface of **microlenses** that form one or more images at positions internal to the layer of material, at least one of the images being a partially complete **image**. Additional layers, such as retroreflective, translucent, transparent, or optical structure layers may also be incorporated into the sheeting.

- (C)
Translucent, transparent, or semi-translucent microlens sheetings with **composite** images are disclosed, in which a **composite image** floats above or below the sheeting, or both. The **composite image** may be two-dimensional or three-dimensional. The sheeting may have at least one layer of material having a surface of **microlenses** that form one or more images at positions internal to the layer of material, at least one of the images being a partially complete **image**. Additional layers, such as retroreflective, translucent, transparent, or optical structure layers may also be incorporated into the sheeting.



PN

- [MY148925](#) A 20130614

PR

- US20060495999 20060728

AP

- MY2009PI00346 20070717

DT

- I

CCI

- [B29D11/00278](#) ; [B29C61/0616](#) ;
[G01K3/04](#) ; [G01K5/483](#) ;
[G02B3/0031](#) ; [G02B3/14](#)

PA

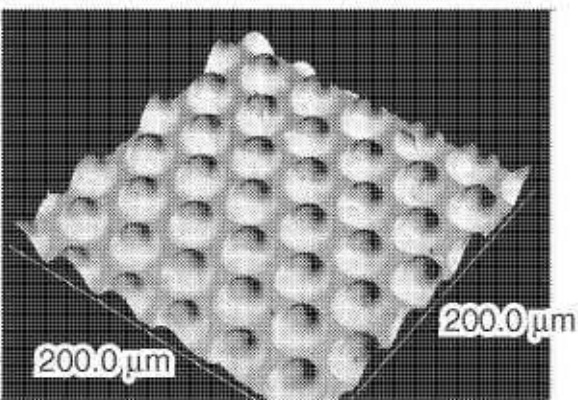
- 3M INNOVATIVE PROPERTIES CO [US]

TI

- MICROLENS SHEETING WITH FLOATING **IMAGE** USING A SHAPE MEMORY MATERIAL

AB

- A SHEETING (10) INCLUDES A LAYER OF A SHAPE-MEMORY POLYMER MATERIAL HAVING A SURFACE OF **MICROLENSSES** (14), WHEREIN EACH OF THE **MICROLENSSES** (14) IS ASSOCIATED WITH ONE OF A PLURALITY OF IMAGES WITHIN THE SHEETING (10). THE LAYER OF THE SHAPE-MEMORY POLYMER MATERIAL IS RESPONSIVE TO AN EXTERNAL STIMULUS; E.G., TEMPERATURE, SOLVENT,OR MOISTURE; BY TRANSITIONING FROM A FIRST STATE IN WHICH AN OPTICAL PROPERTY OF THE **MICROLENSSES** (14) HAS A FIRST VALUE TO A SECOND STATE IN WHICH THE OPTICAL PROPERTY OF THE **MICROLENSSES** (14) HAS A SECOND VALUE. THE **MICROLENSSES** (14) HAVE REFRACTIVE SURFACES THAT TRANSMIT LIGHT TO POSITIONS WITHIN THE SHEETING TO PRODUCE A **COMPOSITE IMAGE** FROM THE IMAGES FORMED WITHIN THE SHEETING WHEN THE LAYER OF THE SHAPE-MEMORY POLYMER MATERIAL IS IN ONE OF THE FIRST STATE AND THE SECOND STATE. AT LEAST ONE OF THE IMAGES IS A PARTIALLY COMPLETE **IMAGE**, AND EACH OF THE IMAGES IS ASSOCIATED WITH A DIFFERENT ONE OF THE **MICROLENSSES**.



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PN

- [MY148551](#) A 20130430

PR

- US20060399695 20060406

AP

- MY2008PI03880 20070402

DT

- I

CCI

- [B44F1/10](#) ; [G02B3/0006](#) ;
[G02B5/128](#) ; [G02B27/2214](#) ;
[G02B27/2292](#)

PA

- 3M INNOVATIVE PROPERTIES CO [US]

TI

- SHEETING WITH **COMPOSITE**

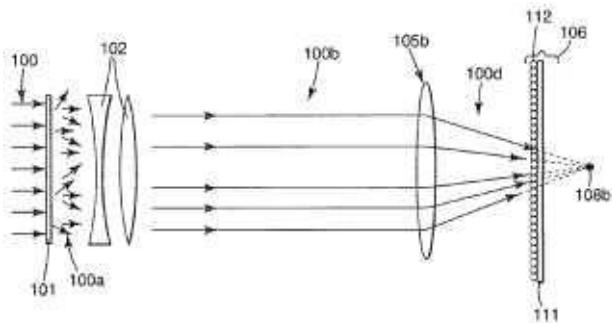


IMAGE THAT FLOATS

AB - TRANSLUCENT, TRANSPARENT, OR SEMI-TRANSLUCENT MICROLENS SHEETINGS WITH **COMPOSITE** IMAGES (806A, 806B) ARE DISCLOSED, IN WHICH A **COMPOSITE IMAGE**(806A, 806B) FLOATS ABOVE (808) OR BELOW THE SHEETING, OR BOTH. THE **COMPOSITE IMAGE** (806A, 806B)MAY BE TWO-DIMENSIONAL OR THREE-DIMENSIONAL. THE SHEETING MAY HAVE AT LEAST ONE LAYER OF MATERIAL (16, 26, 36, 816) HAVING A SURFACE OF **MICROLENSES** THAT FORM ONE OR MORE IMAGES AT POSITIONS INTERNAL TO THE LAYER OF MATERIAL (16, 26, 36, 816), AT LEAST ONE OF THE IMAGES BEING A PARTIALLY COMPLETE **IMAGE**. ADDITIONAL LAYERS, SUCH AS RETROREFLECTIVE, TRANSLUCENT, TRANSPARENT, OR OPTICAL STRUCTURE LAYERS MAY ALSO BE INCORPORATED INTO THE SHEETING (600, 800, 900).

18/73 © EPODOC / EPO

PN - [NZ592210](#) A 20130830

PR - US20080257223
20081023; WO2009US60756
20091015

AP - NZ20090592210 20091015

DT - I

CCI - [B44F1/10](#) ; [B44F7/00](#) ; [G02B3/0006](#) ;
[G02B27/2214](#) ; [B42D25/41](#) ;
[B42D25/42](#) ; [B42D25/425](#) ;
[B42D25/29](#) ; [B42D25/00](#) ;
[G07D7/003](#) ; [G07D7/005](#)

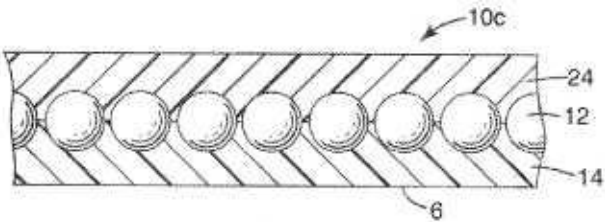
CUI - [B42D25/318](#) ; [B42D25/435](#)

CCA - [B42D2033/10](#) ; [B42D2033/20](#) ;
[B42D2035/20](#) ; [B42D2035/24](#) ;
[B42D2035/34](#) ; [B42D25/324](#)

PA - 3M INNOVATIVE PROPERTIES CO

TI - METHODS OF FORMING SHEETING WITH **COMPOSITE** IMAGES THAT FLOAT AND SHEETING WITH **COMPOSITE** IMAGES THAT FLOAT

AB - 592210 Disclosed is a microlens sheeting with different types of **composite** images, in which the **composite image** appears to float above, in, or below the sheeting, or some combination. One type is viewable with an unaided eye, and another type is viewable only with the aided eye. The sheeting comprises an array of **microlenses**; a material



layer adjacent the array of **microlenses**; a first donor material in contact with the material layer, wherein the donor material forms at least two individual, partially complete images formed on the material layer associated with each of a plurality of the **microlenses**. A first **composite image** is provided by at least one of the individual images, that appears to the unaided eye to float above or below the sheeting, or any combination thereof. A second **composite image**, provided by at least one of the individual images, that appears to the aided eye to float above, in, or below the sheeting, or any combination thereof, wherein the at least one of the individual, partially complete images includes a gaseous void. The second **composite image** is aligned with the first **composite image**. The first or second **composite image** appears under reflected light or transmitted or laser light to float above the sheeting.

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PN - [NZ592107](#) A 20130830

PR - US20080257182
20081023; WO2009US60796
20091015

AP - NZ20090592107 20091015

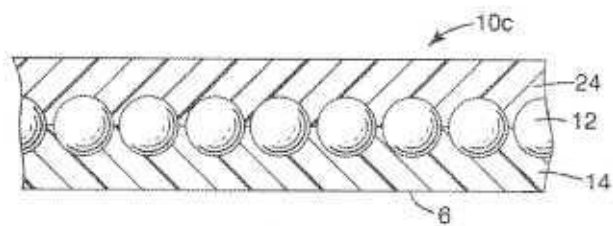
DT - I

CCI - [B44F7/00](#) ; [G02B3/0006](#) ;
[G02B27/2214](#) ; [B42D25/324](#) ;
[B42D25/351](#)

PA - 3M INNOVATIVE PROPERTIES CO

TI - SHEETING WITH **COMPOSITE**
IMAGES THAT FLOAT AND METHOD
OF FORMING

AB - 592107 Microlens sheetings with
different types of **composite**
images are disclosed, in which
the **composite image** floats above,
in, or below the sheeting, or
some combination. One type
of **composite image** may be
viewable to the unaided eye or
an observer and another type
of **composite image** is viewable
only to the aided eye of an
observer. The sheeting
comprises an array of **microlenses**;
a material layer adjacent the
array of **microlenses**; and a first
donor material in contact with



the material layer. The donor material forms at least two individual, partially complete images on the material layer associated with each of a plurality of the **microlenses**. A first **composite image** is provided by at least one of the individual images appears to the unaided eye to float above or below the sheeting, or both. A second **composite image** provided by at least one of the individual images appears to the aided eye to float above, in, or below the sheeting, or any combination thereof. The second **composite image** is aligned with the first **composite image** and includes micrographics.

20/73	© EPODOC / EPO
PN	- US2013215515 A1 20130822
PR	- JP20100249501 20101108; WO2011US57454 20111024
AP	- US201113882550 20111024
DT	- **
CT	- R141 (A1) US2008118862 A1 []; US2009122412 A1 []
CCI	- G02B3/0056 ; G02B5/128 ; G02B27/2292
CUI	- G02B3/005
PA	- KINOSHITA YASUHIRO [JP]; HATTORI JIRO [JP]; 3M INNOVATIVE PROPERTIES CO [US]
TI	- MICROLENS LAMINATE CAPABLE OF PROVIDING FLOATING IMAGE
AB	- The present disclosure provides a microlens laminate having a protected surface and exhibiting excellent appearance. The microlens laminate is capable of providing a composite image that floats above, in the plane of and/or below the laminate. The microlens laminate includes (a) a microlens sheeting comprising a microlens layer composed of a plurality of microlenses , the microlens layer having first and second sides, and a light- sensitive material layer disposed adjacent the first side of the microlens layer; and (b) a transparent material layer disposed at the second side of the microlens layer in the microlens sheeting.

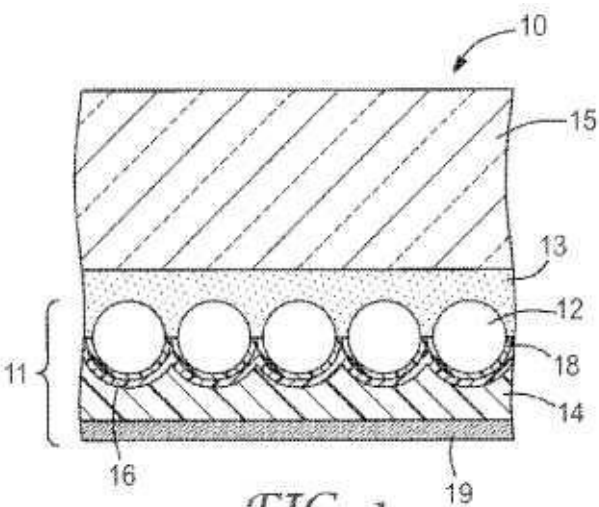


FIG. 1

21/73	© EPODOC / EPO
PN	- CN103257379 A 20130821
PNFP	- CN103257379B B 20150805
PR	- US20070990446P 20071127; CN20088117941 20081110
AP	- CN20131143704 20081110
DT	- I
CCI	- B29D11/00365 ; G02B3/0031 ; G02B3/0056 ; G02B27/2292
PA	- (A) 3M INNOVATIVE PROPERTIES CO
TI	- (A) Methods for forming sheeting with a composite image that floats
AB	- (A) Provided are methods for forming sheeting with a composite image that floats. A sheeting and a method of forming a sheeting from a master tool are described where the sheeting has a composite image that floats above or below the sheeting. The method includes providing a first sheeting comprising a first array of microlenses and a photopolymerizable first material layer adjacent to the first array of microlenses . Another step is exposing the first sheeting to a radiation source to form a master tool comprising a plurality of polymerized first structured areas in the first material layer, wherein at least some of the first structured areas include a portion shape in common with at least some of the first structured areas and wherein each first structured area is associated with one of the first array of microlenses . Yet another step is replicating the plurality of first structured areas using a substance that conforms to the plurality of structured areas to form a second material layer having a plurality of replicated structured areas.

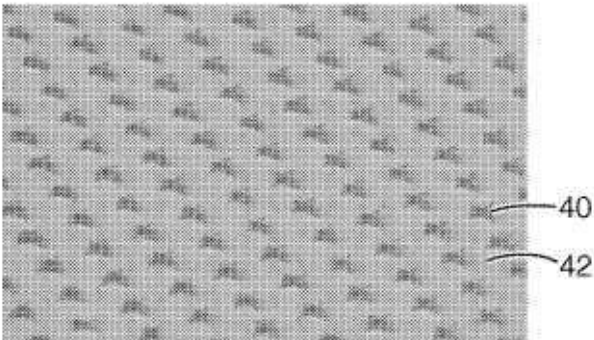


Fig. 4 10μm

PN

- [CN103201671](#) A 20130710

PNFP

- CN103201671B B 20150826

PR

- WO2011US57454
20111024; JP20100249501 20101108

AP

- CN2011853337 20111024

DT

- I

CT

- || STSE (A)
[US2008118862](#) A1 20080522
[XY] (DUNN DOUGLAS S [US], et al)
[X] 1-11
说明书第[0041],[0068],[0060],
[0061],[0074],[0127],[0142]段及附图
2
[Y] 1-11
[JP2009047952](#) A 20090305
[Y] (PANASONIC CORP)
[Y] 6
说明书第[0042]段附图2
[CN101283294](#) A 20081008 [A] (3M
INNOVATIVE PROPERTIES CO [US])
[A] 1-11
全文

CCI

- [G02B3/0056](#) ; [G02B5/128](#) ;
[G02B27/2292](#)

CUI

- [G02B3/005](#)

PA

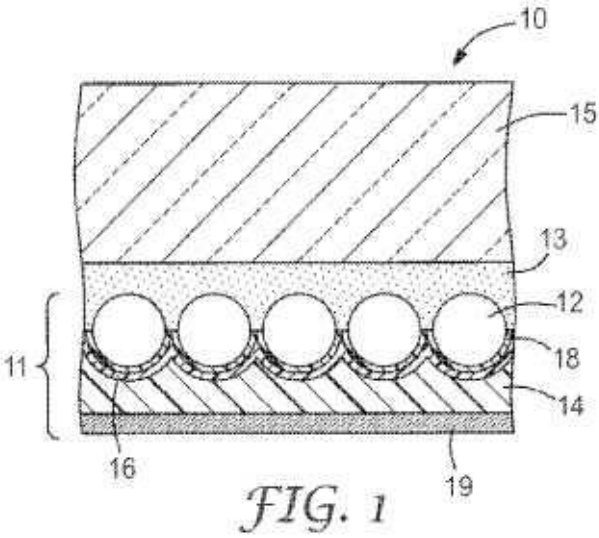
- (A)
3M INNOVATIVE PROPERTIES CO

TI

- (A)
Microlens laminate capable of
providing floating **image**

AB

- (A)
The present disclosure provides
a microlens laminate having a
protected surface and exhibiting
excellent appearance. The
microlens laminate is capable of
providing a **composite image** that
floats above, in the plane of,
and/or below the laminate. The
microlens laminate includes (a)
a microlens sheeting comprising
a microlens layer composed of a
plurality of **microlenses**, the
microlens layer having first and
second sides, and a light-
sensitive material layer
disposed adjacent the first side
of the microlens layer; and (b) a
transparent material layer
disposed at the second side of
the microlens layer in the
microlens sheeting.



PN - [US2013065203](#) A1 20130314

PNFP - US8665523 B2 20140304

PR - US201113230063 20110912

AP - US201113230063 20110912

DT - *; Rep

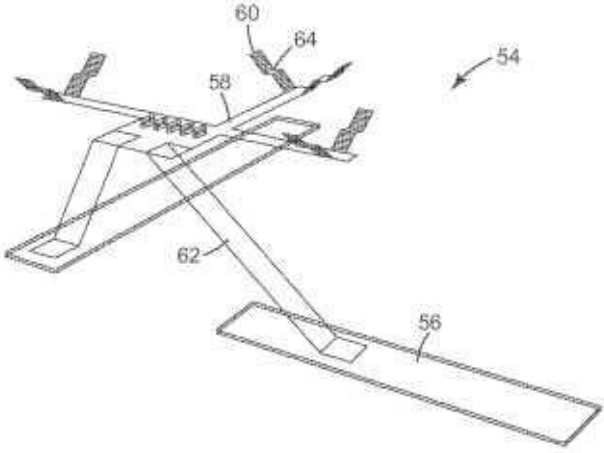
CT - || STSE (B2)
[US3895867](#) A 19750722 [] (LO ALLEN WAH, et al)
[US6288842](#) B1 20010911 [] (FLORCZAK JEFFREY M [US], et al)
[US7068434](#) B2 20060627 [] (FLORCZAK JEFFREY M [US], et al)
[US7336422](#) B2 20080226 [] (DUNN DOUGLAS S [US], et al)
[US7800825](#) B2 20100921 [] (BROOKS BRIAN E [US], et al)
[US7981499](#) B2 20110719 [] (ENDLE JAMES P [US], et al)
[US7995278](#) B2 20110809 [] (ENDLE JAMES P [US], et al)
[US8111463](#) B2 20120207 [] (ENDLE JAMES P [US], et al)
[US8514493](#) B2 20130820 [] (ENDLE JAMES P [US], et al)
[US8537470](#) B2 20130917 [] (ENDLE JAMES P [US], et al)
- || R141 (A1)
[US6288842](#) B1 [];
[US8514493](#) B2 [];
[US7800825](#) B2 [];
[US8537470](#) B2 [];
[US8111463](#) B2 [];
[US7981499](#) B2 [];
[US7995278](#) B2 [];
[US7336422](#) B2 [];
[US7068434](#) B2 [];
[US3895867](#) A []

CCI - [G09B25/04](#) ; [G09B29/007](#)

PA - (A1)
HATTORI JIRO [JP]; MIZUMOTO YOICHIRO [JP]; 3M INNOVATIVE PROPERTIES CO
- (B2)
HATTORI JIRO [JP]; MIZUMOTO YOICHIRO [JP]; 3M INNOVATIVE PROPERTIES CO [US]

TI - (A1 B2)
MULTILAYER 3D FLOATING IMAGES IN A SINGLE SUBSTRATE

AB - (A1 B2)
A multilayer sheeting with a 3D floating **image**. The sheeting includes a layer of **microlenses** and a multilayer material disposed adjacent the **microlenses**. The multilayer material includes multiple adjacent layers having X-Y planar positions and a Z-direction orthogonal to the X-Y planar positions. Individual images,



which contrast with the material, are formed in the multilayer material and include connected elements at interfaces between the multiple layers and conjunction elements between connected elements. The connected elements are registered in the Z-direction at the X-Y planar positions in the interfaces between the layers. The individual images collectively form a **composite 3D image** that appears to the unaided eye to be three-dimensional and floating above or below the sheeting, or both.

- 24/73 © EPODOC / EPO
- PN

- [US2013010048](#) A1 20130110
- PR

- US201213616532
20120914; US201113248795
20110929; US20070960837
20071220; US20060399695
20060406; US20010898580
20010703; US20000510428 20000222
- AP

- US201213616532 20120914
- DT

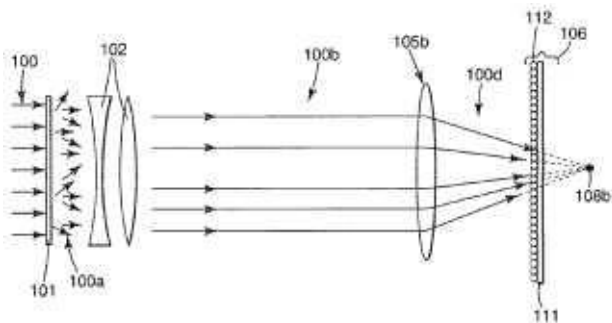
- **
- CCI

- [B44F1/10](#) ; [G02B3/0006](#) ;
[G02B5/128](#) ; [G02B27/2214](#) ;
[G02B27/2292](#)
- PA

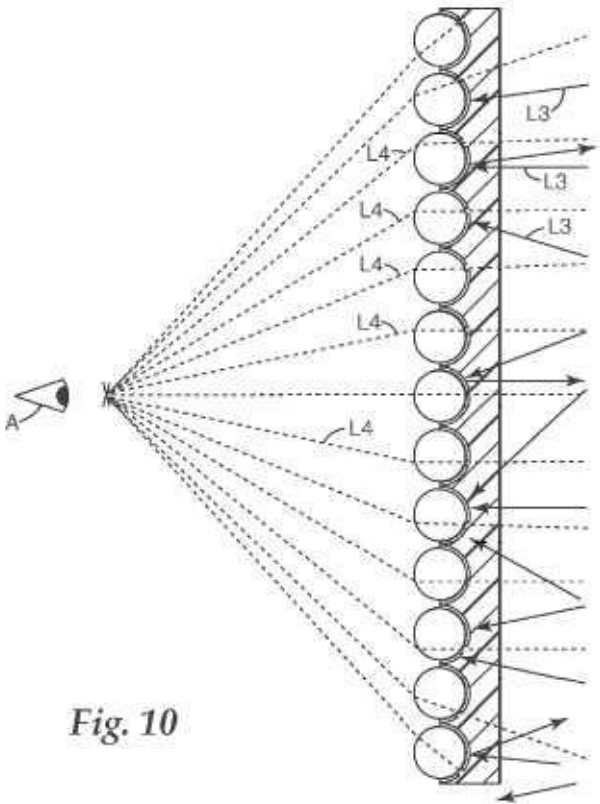
- 3M INNOVATIVE PROPERTIES CO;
DUNN DOUGLAS S [US]; SMITHSON
ROBERT L W [US]; KRASA ROBERT T
[US]; DOLEZAI MICHAEL W [US]
- TI

- SHEETING WITH **COMPOSITE
IMAGE** THAT FLOATS
- AB

- Translucent, transparent, or semi-
translucent microlens sheetings
with **composite** images are
disclosed, in which a **composite
image** floats above or below the
sheeting, or both. The **composite
image** may be two-dimensional
or three-dimensional. The
sheeting may have at least one
layer of material having a
surface of **microlenses** that form
one or more images at positions
internal to the layer of material,
at least one of the images being
a partially complete **image**.
Additional layers, such as
retroreflective, translucent,
transparent, or optical structure
layers may also be incorporated
into the sheeting.

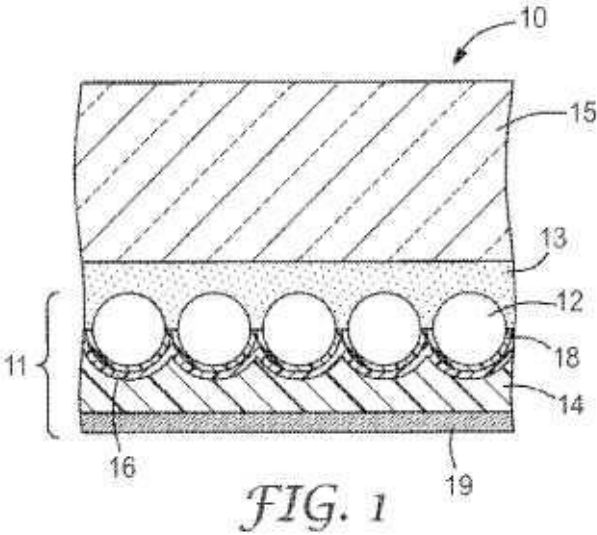


PN	- CN102830494 A 20121219
PNFP	- CN102830494B B 20150401
PR	- US20070949092P 20070711
AP	- CN20121265275 20080617
DT	- I
CT	- STSE (A) JPH05188499 A 19930730 [A] (TOPPAN PRINTING CO LTD) [A] 1-6 * 全文 *; CN1452726 A 20031029 [A] (3M INNOVATIVE PROPERTIES CO [US]) [A] 1-6 * 全文 *; CN1650193 A 20050803 [A] (3M INNOVATIVE PROPERTIES CO [US]) [A] 1-6 * 全文 *; CN101379423 A 20090304 [A] (NANOVENTIONS HOLDINGS LLC [US]) [A] 1-6 * 全文 *
CCI	- G02B27/2214 ; G02B27/2292 ; G03B21/62
PA	- (A B) 3M INNOVATIVE PROPERTIES CO
TI	- (A B) Sheeting with composite image that floats
AB	- (A) A sheeting with a composite image that floats is provided. Techniques are described for forming microlens sheeting having composite images that appear to float with respect to the plane of the sheeting. In one embodiment, a method comprises forming one or more images within a sheeting having a surface of microlenses , wherein at least one of the images is a partially complete image , and wherein each of the images is associated with a different one of the microlenses , wherein the microlenses have refractive surfaces that transmit light to positions within the sheeting to produce a plurality of composite images from the images formed within the sheeting so that each of the composite images appears to float with respect to the plane of the sheeting, and wherein forming the one or more images comprises forming the one or more images such that each of the composite images is associated with a different viewing angle range.



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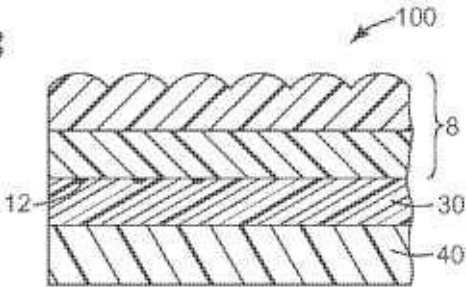
- PN - [TW201235692](#) A 20120901
- PR - JP20100249501 20101108
- AP - TW20110140575 20111107
- DT - I
- CCI - [G02B3/0056](#) ; [G02B5/128](#) ;
[G02B27/2292](#)
- CUI - [G02B3/005](#)
- PA - 3M INNOVATIVE PROPERTIES CO
[US]
- TI - Microlens laminate capable of
providing floating **image**
- AB - The present disclosure provides
a microlens laminate having a
protected surface and exhibiting
excellent appearance. The
microlens laminate is capable of
providing a **composite image** that
floats above, in the plane of,
and/or below the laminate. The
microlens laminate includes (a)
a microlens sheeting comprising
a microlens layer composed of a
plurality of **microlenses**, the
microlens layer having first and
second sides, and a light-
sensitive material layer
disposed adjacent the first side
of the microlens layer; and (b) a
transparent material layer
disposed at the second side of
the microlens layer in the
microlens sheeting.



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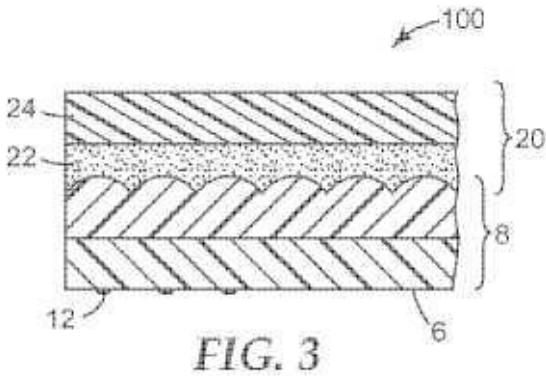
- PN - [WO2012162057](#) A2 20121129
- PNFP - WO2012162057 A3 20130124
- PR - US201161488206P 20110520
- AP - WO2012US38110 20120516
- DT - *; Rep
- CT - [KR] ISR (A3)
[US2008284157](#) A1 20081120
[X] (MUKE SANI [AU], et al);
[US2008118862](#) A1 20080522
[X] (DUNN DOUGLAS S [US], et al);
[WO2007047259](#) A1 20070426
[Y] (3M INNOVATIVE PROPERTIES
CO [US]);
[WO2010115235](#) A1 20101014
[X] (AUSTRALIA RESERVE BANK
[AU], et al)
- CCI - [G02B3/0056](#) ; [B42D25/41](#) ;
[B42D25/29](#) ; [B42D25/455](#) ;
[B42D25/46](#)
- CUI - [B42D25/23](#) ; [B42D25/00](#) ;
[B42D25/24](#) ; [B42D25/285](#) ;
[B42D25/435](#) ; [B42D25/21](#)
- CCA - [B42D2033/30](#) ; [B42D2035/34](#) ;

FIG. 3



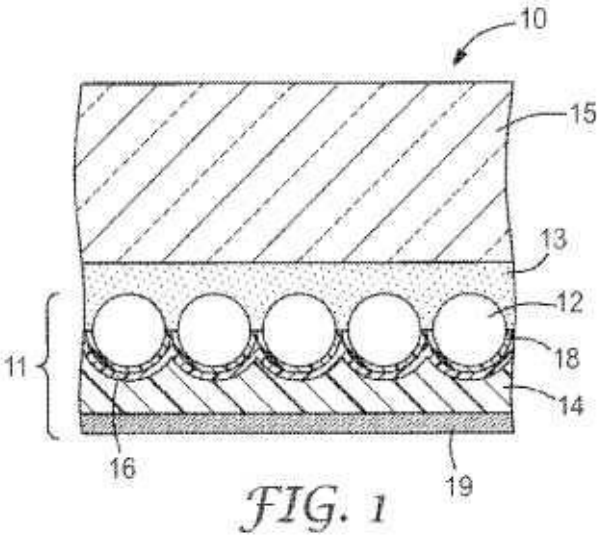
	B42D2035/50 ; B42D25/324 ; Y10T156/10
PA	- (A2 A3) 3M INNOVATIVE PROPERTIES CO [US]; CHEN-HO KUI [US]; HAAS CHRISTOPHER K [US]; DUNN DOUGLAS S [US]; KONG STEVEN H [US]; OLSON DAVID B [US]; LARSON RANDY A [US]; POTTS TRAVIS L [US]
TI	- (A2 A3) LASER-PERSONALIZABLE SECURITY ARTICLES
AB	- (A2 A3) Laser-personalizable security articles include multi-layer security documents. The multi- layer security document includes an optically transparent cover layer, a composite image and an imagable layer adjacent to the cover layer. The first surface of the cover layer is at least partially a microstructured surface, where the microstructured surface forms microlenses or a lenticular surface. The composite image is made by a collection of complete or partial images viewed through the microstructured surface of the cover layer. The composite image is located on or within the second surface of the cover layer. The imagable layer is a laser imagable layer. When imaged, a personalized second composite three dimensional image is created on or in the imagable layer.

28/73	© EPODOC / EPO
PN	- WO2012162041 A2 20121129
PNFP	- WO2012162041 A3 20130307
PR	- US201161488205P 20110520
AP	- WO2012US38026 20120516
DT	- *; Rep
CT	- KR ISR (A3) WO2006137738 A2 20061228 [X] (SDU IDENTIFICATION BV [NL], et al); US2008212192 A1 20080904 [A] (STEENBLIK RICHARD A [US], et al); US6758936 B1 20040706 [A] (KIEKHAEFER JOHN H [US], et al); US2007081254 A1 20070412 [A] (ENDLE JAMES P [US], et al)
CCI	- B42D25/41 ; B42D25/29 ; B42D25/47
CUI	- B32B7/12 ; B32B37/18 ; B32B3/10

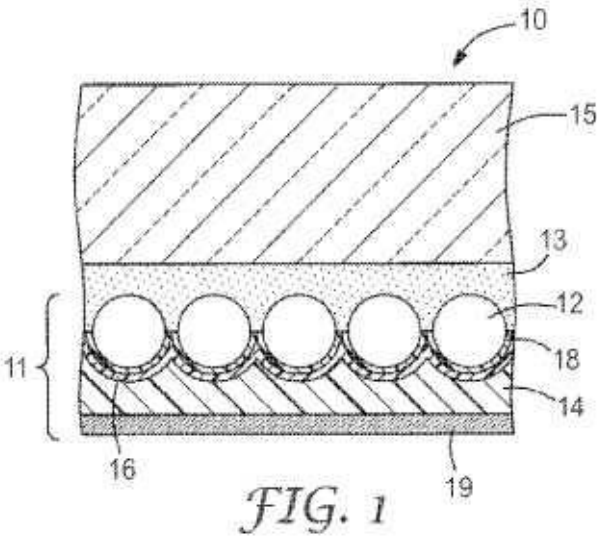


CCA	- B42D2033/04 ; B42D2033/24 ; B42D2033/30 ; B42D2035/20 ; B42D2035/36 ; B42D2035/50 ; B42D25/324 ; Y10T156/10 ; Y10T428/24868
CUA	- B32B2255/26 ; B32B2307/412 ; B32B2554/00
PA	- (A2 A3) 3M INNOVATIVE PROPERTIES CO [US]; CHEN-HO KUI [US]; HAAS CHRISTOPHER K [US]; DUNN DOUGLAS S [US]; FANSLER DUANE D [US]; XIA JIANHUI [US]; ZHU DONG-WEI [US]; FILIATRAULT TIMOTHY D [US]; OLSON DAVID B [US]; LARSON RANDY A [US]; ZHANG JUN-YING [US]; HAO ENCAI [US]
TI	- (A2 A3) LASER-PERSONALIZABLE SECURITY ARTICLES
AB	- (A2 A3) Laser-personalizable security articles include a multi-layer security document and an optically transparent processing tape. The multi-layer security document includes an optically transparent cover layer, a composite image and an imagable layer adjacent to the cover layer. The first surface of the cover layer is at least partially a microstructured surface, where the microstructured surface forms microlenses or a lenticular surface. The composite image is made by a collection of complete or partial images viewed through the microstructured surface of the cover layer. The composite image is located on or within the second surface of the cover layer. The imagable layer is a laser imagable layer. The optically transparent processing tape sufficiently wets out on the microstructured surface to render the microstructured surface invisible to a writing laser.

PN - [JP2012103315](#) A 20120531
 PR - JP20100249501 20101108
 AP - JP20100249501 20101108
 DT - I
 CCI - [G02B3/0056](#) ; [G02B5/128](#) ;
[G02B27/2292](#)
 CUI - [G02B3/005](#)
 FI - B44F1/04; G02B27/22; G02B3/00&A
 FT - 2H199/BA08; 2H199/BA15;
 2H199/BB04; 2H199/BB30;
 2H199/BB68
 PA - THREE M INNOVATIVE PROPERTIES
 TI - MICROLENS LAMINATED BODY
 CAPABLE OF PROVIDING
 FLOATING **COMPOSITE IMAGE**
 AB - PROBLEM TO BE SOLVED: To
 provide a microlens laminated
 body which has a protected
 surface and excellent
 appearance.SOLUTION: A
 microlens laminated body
 comprises: a microlens sheet
 which includes a microlens layer
 having a first surface and a
 second surface and being
 configured by a plurality
 of **microlenses**, and a
 photosensitive material layer
 disposed close to the first
 surface side of the microlens
 layer; and a transparent material
 layer disposed on the second
 surface side of the microlens
 layer in the microlens sheet. The
 microlens laminated body can
 provide a **composite image**
 floating on the microlens
 laminated body, in the surface of
 the laminated body, and/or
 under the laminated body.



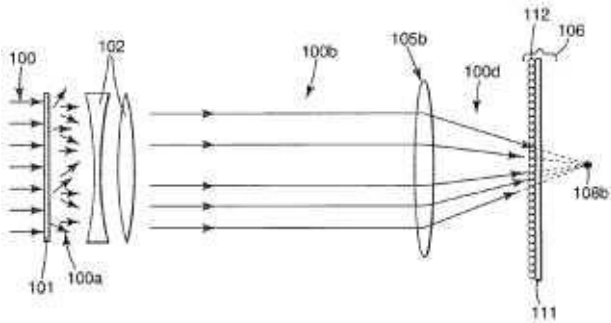
30/73 © EPODOC / EPO
 PN - [WO2012064497](#) A2 20120518
 PNFP - WO2012064497 A3 20120719
 PR - JP20100249501 20101108
 AP - WO2011US57454 20111024
 DT - *; Rep
 CT - [KR] ISR (A3)
[US2008118862](#) A1 20080522
 [X] (DUNN DOUGLAS S [US], et al);
[US2007081254](#) A1 20070412
 [A] (ENDLE JAMES P [US], et al);
[JP2009047952](#) A 20090305
 [A] (PANASONIC CORP)
 CCI - [G02B3/0056](#) ; [G02B5/128](#) ;
[G02B27/2292](#)
 CUI - [G02B3/005](#)
 PA - (A2 A3)
 3M INNOVATIVE PROPERTIES CO



	[US]; KINOSHITA YASUHIRO [JP]; HATTORI JIRO [JP]
TI	- (A2 A3) MICROLENS LAMINATE CAPABLE OF PROVIDING FLOATING IMAGE
AB	- (A2 A3) The present disclosure provides a microlens laminate having a protected surface and exhibiting excellent appearance. The microlens laminate is capable of providing a composite image that floats above, in the plane of, and/or below the laminate. The microlens laminate includes (a) a microlens sheeting comprising a microlens layer composed of a plurality of microlenses , the microlens layer having first and second sides, and a light- sensitive material layer disposed adjacent the first side of the microlens layer; and (b) a transparent material layer disposed at the second side of the microlens layer in the microlens sheeting.

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PN	- US2012019607 A1 20120126
PR	- US201113248795 20110929; US20070960837 20071220; US20060399695 20060406; US20010898580 20010703; US20000510428 20000222
AP	- US201113248795 20110929
DT	- **
CT	- R141 (A1) US4691993 A []; US5680171 A []; JPH07140571 A []
CCI	- B44F1/10 ; G02B3/0006 ; G02B5/128 ; G02B27/2214 ; G02B27/2292
PA	- DUNN DOUGLAS S [US]; SMITHSON ROBERT L W [US]; KRASA ROBERT T [US]; DOLEZAL MICHAEL W [US]; 3M INNOVATIVE PROPERTIES CO
TI	- SHEETING WITH COMPOSITE IMAGE THAT FLOATS
AB	- Translucent, transparent, or semi- translucent microlens sheetings with composite images are disclosed, in which a composite image floats above or below the sheeting, or both. The composite image may be two-dimensional or three-dimensional. The sheeting may have at least one layer of material having a surface of microlenses that form



one or more images at positions internal to the layer of material, at least one of the images being a partially complete **image**. Additional layers, such as retroreflective, translucent, transparent, or optical structure layers may also be incorporated into the sheeting.

- 32/73 © EPODOC / EPO
- PN

- [TW200812825](#) A 20080316
- PNFP

- TWI402183B B 20130721
- PR

- US20060495999 20060728
- AP

- TW20070127550 20070727
- DT

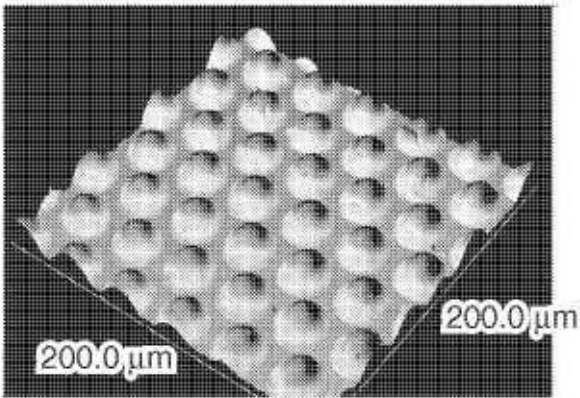
- I
- CCI

- [B29D11/00278](#) ; [B29C61/0616](#) ;
[G01K3/04](#) ; [G01K5/483](#) ;
[G02B3/0031](#) ; [G02B3/14](#)
- PA

- (A B)
3M INNOVATIVE PROPERTIES CO
[US]
- TI

- (A B)
Microlens sheeting with
floating **image** using a shape
memory material
- AB

- (A)
A sheeting includes a layer of a
shape-memory polymer material
having a surface of **microlenses**,
wherein each of the **microlenses**
is associated with one of a
plurality of images within the
sheeting. The layer of the shape-
memory polymer material is
responsive to an external
stimulus; e.g., temperature,
solvent, or moisture; by
transitioning from a first state in
which an optical property of
the **microlenses** has a first value
to a second state in which the
optical property of
the **microlenses** has a second
value. The **microlenses** have
refractive surfaces that transmit
light to positions within the
sheeting to produce a **composite
image** from the images formed
within the sheeting when the
layer of the shape-memory
polymer material is in one of the
first state and the second state.
At least one of the images is a
partially complete **image**, and
each of the images is associated
with a different one of
the **microlenses**.



PN - [CN102016655](#) A 20110413

PNFP - CN102016655B B 20120321

PR - WO2007US73649
20070717; US20060495999 20060728

AP - CN2007828591 20070717

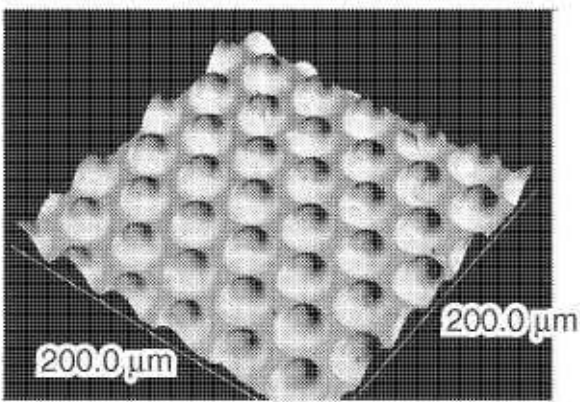
DT - I

CCI - [B29D11/00278](#) ; [B29C61/0616](#) ;
[G01K3/04](#) ; [G01K5/483](#) ;
[G02B3/0031](#) ; [G02B3/14](#)

PA - (A B)
3M INNOVATIVE PROPERTIES CO

TI - (A B)
Microlens sheeting with
floating **image** using a shape
memory material

AB - (A B)
A sheeting includes a layer of a
shape-memory polymer material
having a surface of **microlenses**,
wherein each of the **microlenses**
is associated with one of a
plurality of images within the
sheeting. The layer of the shape-
memory polymer material is
responsive to an external
stimulus; e.g., temperature,
solvent, or moisture; by
transitioning from a first state in
which an optical property of
the **microlenses** has a first value
to a second state in which the
optical property of
the **microlenses** has a second
value. The **microlenses** have
refractive surfaces that transmit
light to positions within the
sheeting to produce a **composite
image** from the images formed
within the sheeting when the
layer of the shape-memory
polymer material is in one of the
first state and the second state.
At least one of the images is a
partially complete **image**, and
each of the images is associated
with a different one of
the **microlenses**.



PN	- US2010316959 A1 20101216
PNFP	- US8586285 B2 20131119
PR	- US20080744515 20081110; US20070990446P 20071127; WO2008US82951 20081110
AP	- US20080744515 20081110
DT	- **
CT	- STSE (B2) US4054635 A 19771018 [] (AMERICAN CAN CO) US5279689 A 19940118 [] (DU PONT [US]) US6033810 A 20000307 [] (DAINIPPON PRINTING CO LTD [JP]) US6316153 B1 20011113 [] (UNIV CONNECTICUT [US]) US2004012872 A1 20040122 [] (FLEMING PATRICK R [US], et al) US2004067451 A1 20040408 [] (DEVOE ROBERT J [US], et al) WO2006130995 A2 20061214 [] (UNIV MCGILL [CA], et al) - R141 (A1) US4054635 A []; US5279689 A []; US2004012872 A1 []; US2004067451 A1 []; US6033810 A []; WO2006130995 A2 []; US6316153 B1 []; US3365350 A []; US4424990 A []; US4634220 A []; US4799739 A []; US4892336 A []; US5279912 A []; US5594841 A []; US5706133 A []; US5712731 A []; US5856061 A []; US6177217 B1 []; US2004002074 A1 []; US7165959 B2 []; US2008023890 A1 []; US2008024872 A1 []; US2008027199 A1 []; US7648744 B2 []; US3306974 A []; US4315665 A []; US5091483 A []; US5183597 A []; US5491045 A []; US5717844 A []; US6019287 A []; US6028621 A []; US6351537 B1 []; US2004038822 A1 []; US2006029753 A1 []; US7006294 B2 []; US2008037131 A1 [];

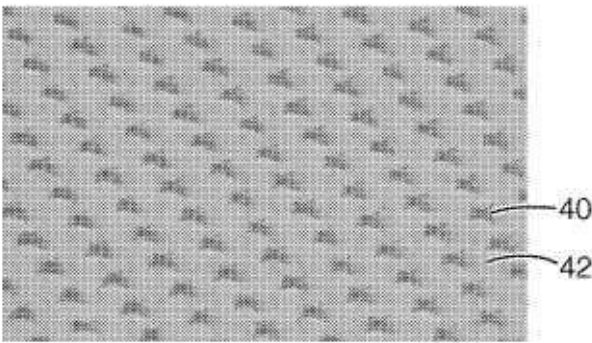


Fig. 4

[US7333268](#) B2 [];
[US7336422](#) B2 [];
[US2500511](#) A [];
[US3503315](#) A [];
[US4253958](#) A [];
[US4650283](#) A [];
[US4732453](#) A [];
[US5877895](#) A [];
[US5882774](#) A [];
[US5889118](#) A [];
[US6197474](#) B1 [];
[US6531230](#) B1 [];
[US2005057812](#) A1 [];
[US7196822](#) B2 [];
[US1905716](#) A [];
[US2279825](#) A [];
[US3801183](#) A [];
[US4082426](#) A [];
[US4200875](#) A [];
[US4917292](#) A [];
[US4920039](#) A [];
[US5105206](#) A [];
[US5204160](#) A [];
[US5503902](#) A [];
[US5506300](#) A [];
[US5744291](#) A [];
[US5894069](#) A [];
[US5896230](#) A [];
[US6212805](#) B1 [];
[US6222650](#) B1 [];
[US6369844](#) B1 [];
[US6369911](#) B1 [];
[US6377238](#) B1 [];
[US6552830](#) B2 [];
[US2007081254](#) A1 [];
[US2010103527](#) A1 [];
[US2010103528](#) A1 [];
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[US6228555](#) B1 [];
[US2002054434](#) A1 [];
[US6388043](#) B1 [];
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[US3584369](#) A [];
[US3671122](#) A [];
[US4935335](#) A [];
[US5639580](#) A [];
[US5642226](#) A [];
[US5770124](#) A [];
[US6242152](#) B1 [];

	US6398270 B1 []
CCI	- B29D11/00365 ; G02B3/0031 ; G02B3/0056 ; G02B27/2292
PA	- (B2) GATES BRIAN J [US]; KRASA ROBERT T [US]; POTTS TRAVIS L [US]; WETZELS SERGE [US]; 3M INNOVATIVE PROPERTIES CO [US]
TI	- (A1 B2) METHODS FOR FORMING SHEETING WITH A COMPOSITE IMAGE THAT FLOATS AND A MASTER TOOLING
AB	- (A1 B2) A sheeting and a method of forming a sheeting from a master tool are described where the sheeting has a composite image that floats above or below the sheeting. The method includes providing a first sheeting comprising a first array of microlenses and a photopolymerizable first material layer adjacent to the first array of microlenses . Another step is exposing the first sheeting to a radiation source to form a master tool comprising a plurality of polymerized first structured areas in the first material layer, wherein at least some of the first structured areas include a portion shape in common with at least some of the first structured areas and wherein each first structured area is associated with one of the first array of microlenses . Yet another step is replicating the plurality of first structured areas using a substance that conforms to the plurality of structured areas to form a second material layer having a plurality of replicated structured areas.

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PN	- CN101878438 A 20101103
PNFP	- CN101878438B B 20130925
PR	- WO2008US82951 20081110; US20070990446P 20071127
AP	- CN20088117941 20081110
DT	- I
CCI	- B29D11/00365 ; G02B3/0031 ; G02B3/0056 ; G02B27/2292
PA	- (A B) 3M INNOVATIVE PROPERTIES CO
TI	- (A B) Methods for forming sheeting

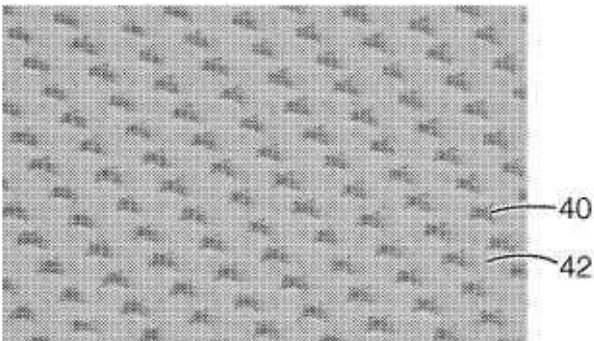


Fig. 4 10µm

with a **composite image** that floats and a master tooling

AB - (A)
A sheeting and a method of forming a sheeting from a master tool are described where the sheeting has a **composite image** that floats above or below the sheeting. The method includes providing a first sheeting comprising a first array of **microlenses** and a photopolymerizable first material layer adjacent to the first array of **microlenses**. Another step is exposing the first sheeting to a radiation source to form a master tool comprising a plurality of polymerized first structured areas in the first material layer, wherein at least some of the first structured areas include a portion shape in common with at least some of the first structured areas and wherein each first structured area is associated with one of the first array of **microlenses**. Yet another step is replicating the plurality of first structured areas using a substance that conforms to the plurality of structured areas to form a second material layer having a plurality of replicated structured areas.

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PN - [RU2009101453](#) A 20100910

PNFP - RU2428730 C2 20110910

PR - US20060495999 20060728

AP - RU20090101453 20070717

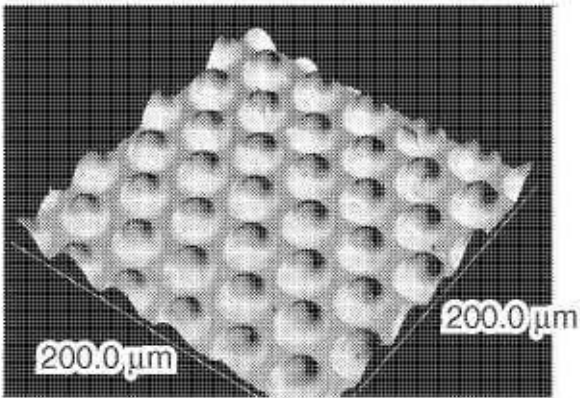
DT - I

CCI - [B29D11/00278](#) ; [B29C61/0616](#) ; [G01K3/04](#) ; [G01K5/483](#) ; [G02B3/0031](#) ; [G02B3/14](#)

PA - (C2)
3M INNOVATIVE PROPERTIES CO [US]

TI - (C2)
MICROLENS PROTECTIVE COATING WITH FLOATING **IMAGE** USING MATERIAL WITH SHAPE MEMORY

AB - (C2)
FIELD: physics. ^ SUBSTANCE: protective coating has a layer of polymer material with shape memory, having a surface made of **microlenses**, where each microlens is associated with one of a plurality of images on the protective coating. The layer of



polymer material with shape memory is sensitive to external stimulating effect, for example to temperature, a solvent or moisture, owing to transition from a first state in which the optical property of the microlens has a first value to a second state in which the optical property of the microlens has a second value. The **microlenses** have refracting surfaces which transmit light to positions in the protective coating, yielding a **composite image** from images formed on the protective coating when the layer of polymer material with shape memory is in one of a first or second state.
 ^ EFFECT: invention provides change in optical properties of the article as a result of the external effect. ^ 9 cl, 19 dwg

39/73 © EPODOC / EPO

- PN - [EP2284596](#) A2 20110216
- PNFP - EP2284596 A3 20121121
- PR - EP20100172537 20000620; EP20000941580 20000620; US20000510428 20000222
- AP - EP20100181565 20000620
- DT - **
- CT - || STSE (A3)
[US5712731](#) A 19980127 [X] (DRINKWATER KENNETH J [GB], et al)
 [X] 1
 * the whole document *;
[US3801183](#) A 19740402 [A] (SEVELIN C, et al)
 [A] 1
 * the whole document *;
[US4200875](#) A 19800429 [AD] (GALANOS DEMOSTHENES G [US])
 [AD] 1
 * column 2, line 58 - column 4, line 55; figures 1-4 *;
[US4082426](#) A 19780404 [AD] (BROWN ROBERT A)
 [AD] 1
 * column 2, line 39 - column 3, line 27; figures 1,2 *;
[EP0583766](#) A1 19940223 [A] (EASTMAN KODAK CO [US])
 [A] 1
 * column 2, line 37 - column 3, line 54; figures 1,2 *;
[WO8303019](#) A1 19830901 [A] (KASSIES MICHIEL)
 [A] 1
 * page 12, line 19 - page 15, line 8; figures 2,3A-3C *
- CCI - [G02B5/128](#) ; [G02B27/2292](#)
- PA - (A2 A3)
 3M INNOVATIVE PROPERTIES CO [US]
- TI - (A2 A3)
 Sheeting with **composite image** that floats
- AB - (A2)
 Microlens sheetings with **composite** images are disclosed, in which the **composite image** floats above or below the sheeting, or both. The **composite image** may be two-dimensional or three-dimensional. Methods for providing such an imaged sheeting, including by the application of radiation to a radiation sensitive material layer adjacent the **microlenses**, are also disclosed.

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PN - [CN101802653](#) A 20100811

PNFP - CN101802653B B 20130327

PR - WO2008US67180
20080617; US20070949092P
20070711

AP - CN20088106663 20080617

DT - I

CCI - [G02B27/2214](#) ; [G02B27/2292](#) ;
[G03B21/62](#)

PA - (A B)
3M INNOVATIVE PROPERTIES CO

TI - (A B)
Sheeting with **composite image**
that floats

AB - (A)
Techniques are described for forming microlens sheeting having **composite** images that appear to float with respect to the plane of the sheeting. As one example, a method comprises forming one or more images within a sheeting having a surface of **microlenses**, wherein at least one of the images is a partially complete **image**, and wherein each of the images is associated with a different one of the **microlenses**, wherein the **microlenses** have refractive surfaces that transmit light to positions within the sheeting to produce a plurality of **composite** images from the images formed within the sheeting sothat each of the **composite** images appears to float with respect to the plane of the sheeting, and wherein forming the one or more images comprises forming the one or more images such that each of the **composite** images is associated with a different viewing angle range.

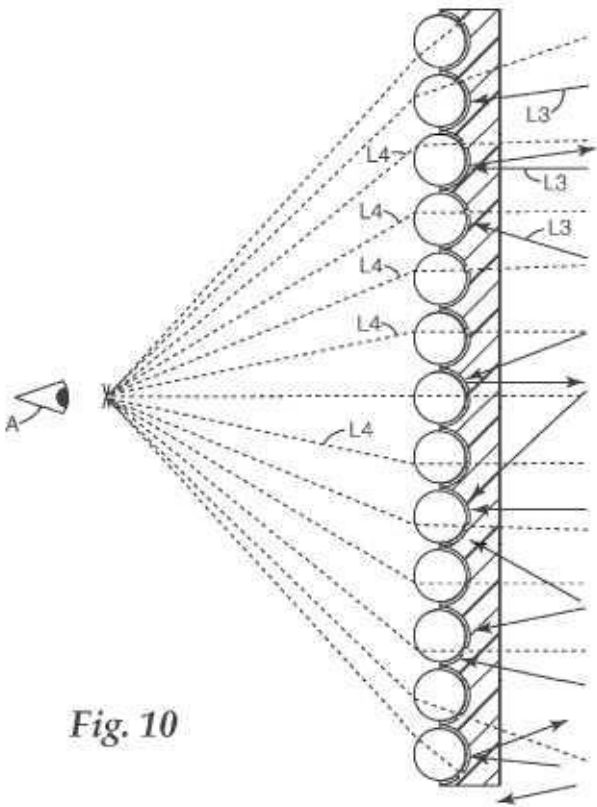


Fig. 10

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PN - [EP2278384](#) A2 20110126

PNFP - EP2278384 A3 20121121

PR - EP20000941580 20000620; US20000510428 20000222

AP - EP20100172537 20000620

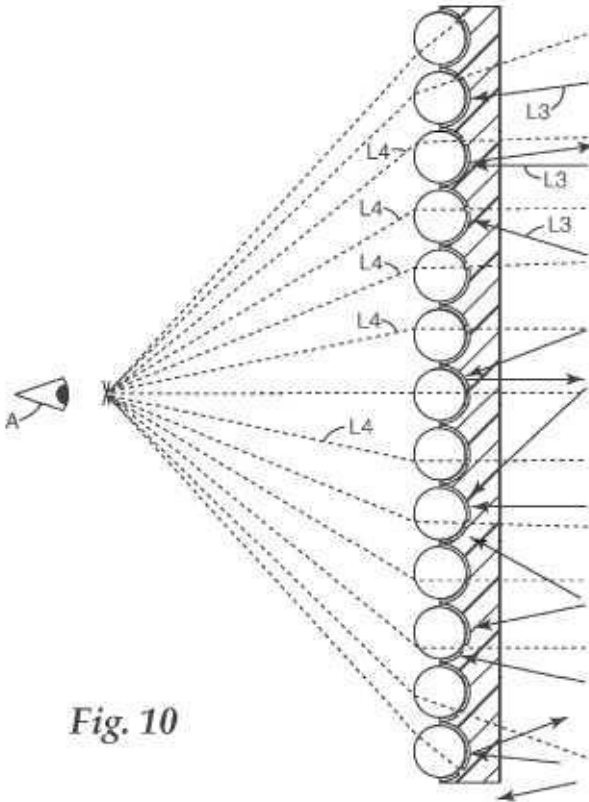
DT - **

CT - || STSE (A3)
[US5712731](#) A 19980127 [X] (DRINKWATER KENNETH J [GB], et al)
[X] 1
* the whole document *;
[US3801183](#) A 19740402 [A] (SEVELIN C, et al)
[A] 1
* the whole document *;
[US4200875](#) A 19800429 [AD] (GALANOS DEMOSTHENES G [US])

	[AD] 1
	* column 2, line 58 - column 4, line 55; figures 1-4 *;
	US4082426 A 19780404 [AD] (BROWN ROBERT A)
	[AD] 1
	* column 2, line 39 - column 3, line 27; figures 1,2 *;
	EP0583766 A1 19940223 [A] (EASTMAN KODAK CO [US])
	[A] 1
	* column 2, line 37 - column 3, line 54; figures 1,2 *;
	WO8303019 A1 19830901 [A] (KASSIES MICHIEL)
	[A] 1
	* page 12, line 19 - page 15, line 8; figures 2,3A-3C *
CCI	- G02B5/128 ; G02B27/2292
PA	- (A2 A3)
	3M INNOVATIVE PROPERTIES CO [US]
TI	- (A2 A3)
	Sheeting with composite image that floats
AB	- (A2)
	Microlens sheetings with composite images are disclosed, in which the composite image floats above or below the sheeting, or both. The composite image may be two-dimensional or three-dimensional. Methods for providing such an imaged sheeting, including by the application of radiation to a radiation sensitive material layer adjacent the microlenses, are also disclosed.

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PN	- US2010182666 A1 20100722
PNFP	- US8459807 B2 20130611
PR	- US20080663755
	20080617; US20070949092P
	20070711; WO2008US67180
	20080617
AP	- US20080663755 20080617
DT	- **
CT	- STSE (B2)
	US2007115555 A1 20070524 [
	] (NELLISSEN ANTONIUS J M [NL])
	US2007278194 A1 20071206 [
	] (HOELSHER MANFRED [DE], et al)
	- R141 (A1)
	US2007278194 A1 [];
	US6069680 A [];
	US5355188 A [];
	US2007115555 A1 []
CCI	- G02B27/2214 ; G02B27/2292 ;
	G03B21/62
PA	- (B2)
	HERBERT SAMMUEL D [US];
	STUDINER IV CHARLES J [US];
	SMITHSON ROBERT L W [US];
	KRASA ROBERT T [US]; WU
	PINGFAN [US]; DUNN DOUGLAS S
	[US]; DOLEZAL MICHAEL W [US];
	3M INNOVATIVE PROPERTIES CO
	[US]
TI	- (A1 B2)
	SHEETING WITH COMPOSITE
	IMAGE THAT FLOATS
AB	- (A1 B2)
	Techniques are described for
	forming microlens sheeting
	having composite images that



appear to float with respect to the plane of the sheeting. As one example, a method comprises forming one or more images within a sheeting having a surface of **microlenses**, wherein at least one of the images is a partially complete **image**, and wherein each of the images is associated with a different one of the **microlenses**, wherein the **microlenses** have refractive surfaces that transmit light to positions within the sheeting to produce a plurality of **composite** images from the images formed within the sheeting so that each of the **composite** images appears to float with respect to the plane of the sheeting, and wherein forming the one or more images comprises forming the one or more images such that each of the **composite** images is associated with a different viewing angle range.

- 43/73 © EPODOC / EPO
- PN

- [KR20100031579](#) A 20100323
- PR

- US20070949092P 20070711
- AP

- KR20097026962 20080617
- DT

- I
- CCI

- [G02B27/2214](#) ; [G02B27/2292](#) ; [G03B21/62](#)
- PA

- 3M INNOVATIVE PROPERTIES CO [US]
- TI

- SHEETING WITH **COMPOSITE IMAGE** THAT FLOATS
- AB

- Techniques are described for forming microlens sheeting having **composite** images that appear to float with respect to the plane of the sheeting. As one example, a method comprises forming one or more images within a sheeting having a surface of **microlenses**, wherein at least one of the images is a partially complete **image**, and wherein each of the images is associated with a different one of the **microlenses**, wherein the **microlenses** have refractive surfaces that transmit light to positions within the sheeting to produce a plurality of **composite** images from the images formed within the sheeting so that each of the **composite** images appears to float with respect to the plane of the sheeting, and wherein forming the one or more images

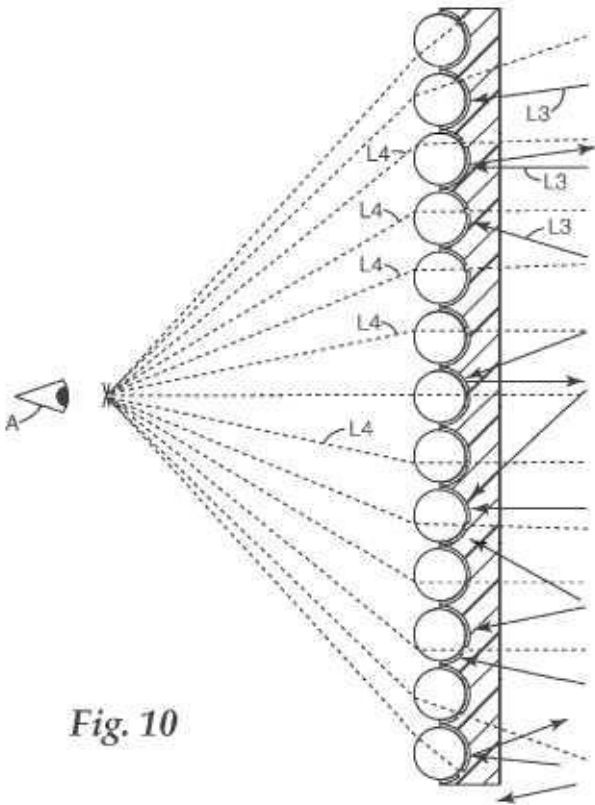
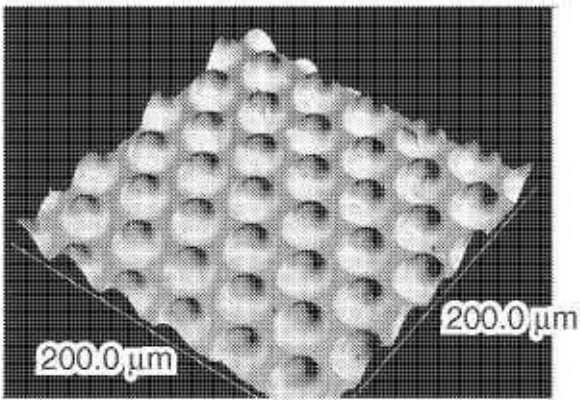


Fig. 10

comprises forming the one or more images such that each of the **composite** images is associated with a different viewing angle range.

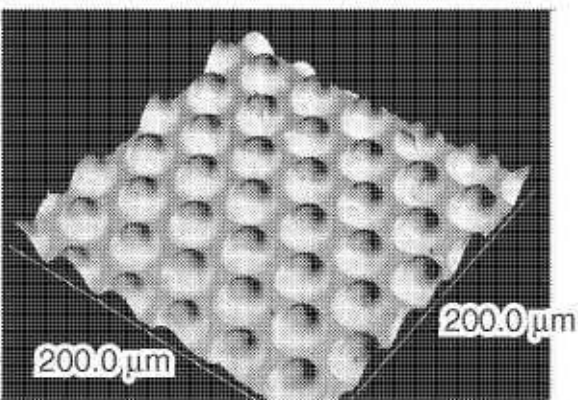
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- PN - [MX2009000838](#) A 20090306
- PR - US20060495999
20060728; WO2007US73649
20070717
- AP - MX20090000838 20070717
- DT - I
- CCI - [B29D11/00278](#) ; [B29C61/0616](#) ;
[G01K3/04](#) ; [G01K5/483](#) ;
[G02B3/0031](#) ; [G02B3/14](#)
- PA - 3M INNOVATIVE PROPERTIES CO
[US]
- TI - MICROLENS SHEETING WITH
FLOATING **IMAGE** USING A SHAPE
MEMORY MATERIAL.
- AB - A sheeting includes a layer of a
shape-memory polymer material
having a surface of **microlenses**,
wherein each of the **microlenses**
is associated with one of a
plurality of images within the
sheeting. The layer of the shape-
memory polymer material is
responsive to an external
stimulus; e.g., temperature,
solvent, or moisture; by
transitioning from a first state in
which an optical property of
the **microlenses** has a first value
to a second state in which the
optical property of
the **microlenses** has a second
value. The **microlenses** have
refractive surfaces that transmit
light to positions within the
sheeting to produce a **composite
image** from the images formed
within the sheeting when the
layer of the shape-memory
polymer material is in one of the
first state and the second state.
At least one of the images is a
partially complete **image**, and
each of the images is associated
with a different one of
the **microlenses**.



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PN - [KR20090033454](#) A 20090403
PR - US20060495999 20060728
AP - KR20097001571 20090123
DT - I
CCI - [B29D11/00278](#) ; [B29C61/0616](#) ;
[G01K3/04](#) ; [G01K5/483](#) ;
[G02B3/0031](#) ; [G02B3/14](#)
PA - 3M INNOVATIVE PROPERTIES CO
[US]
TI - MICROLENS SHEETING WITH
FLOATING **IMAGE** USING A SHAPE
MEMORY MATERIAL
AB - A sheeting includes a layer of a
shape-memory polymer material
having a surface of **microlenses**,
wherein each of the **microlenses**
is associated with one of a
plurality of images within the
sheeting. The layer of the shape-
memory polymer material is
responsive to an external
stimulus; e.g., temperature,
solvent, or moisture; by
transitioning from a first state in
which an optical property of
the **microlenses** has a first value
to a second state in which the
optical property of
the **microlenses** has a second
value. The **microlenses** have
refractive surfaces that transmit
light to positions within the
sheeting to produce a **composite**
image from the images formed
within the sheeting when the
layer of the shape-memory
polymer material is in one of the
first state and the second state.
At least one of the images is a
partially complete **image**, and
each of the images is associated
with a different one of
the **microlenses**.



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PN - [WO2009070434](#) A1 20090604
PR - US20070990446P 20071127
AP - WO2008US82951 20081110
DT - *; Rep
CT - |KR| ISR (A1)
[US2005180012](#) A1 20050818
[A] (SMITH KENNETH L [US]);
[KR20020086566](#) A 00000000
[A] (3M INNOVATIVE PROPERTIES
COMPANY)
CCI - [B29D11/00365](#) ; [G02B3/0031](#) ;
[G02B3/0056](#) ; [G02B27/2292](#)
PA - 3M INNOVATIVE PROPERTIES CO
[US]; GATES BRIAN J [US]; KRASA
ROBERT T [US]; POTTS TRAVIS L

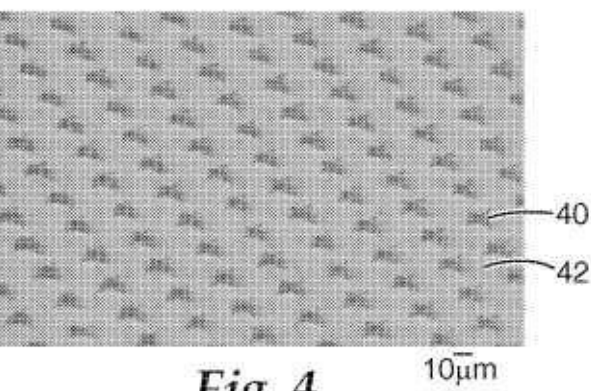
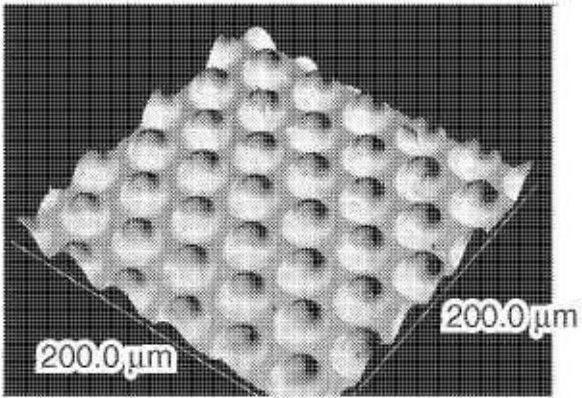


Fig. 4

	[US]; WETZELS SERGE [US]
TI	- METHODS FOR FORMING SHEETING WITH A COMPOSITE IMAGE THAT FLOATS AND A MASTER TOOLING
AB	- A sheeting and a method of forming a sheeting from a master tool are described where the sheeting has a composite image that floats above or below the sheeting. The method includes providing a first sheeting comprising a first array of microlenses and a photopolymerizable first material layer adjacent to the first array of microlenses . Another step is exposing the first sheeting to a radiation source to form a master tool comprising a plurality of polymerized first structured areas in the first material layer, wherein at least some of the first structured areas include a portion shape in common with at least some of the first structured areas and wherein each first structured area is associated with one of the first array of microlenses . Yet another step is replicating the plurality of first structured areas using a substance that conforms to the plurality of structured areas to form a second material layer having a plurality of replicated structured areas.

47/73	© EPODOC / EPO
PN	- CA2657244 A1 20080131
PNFP	- CA2657244 C 20150630
PR	- US20060495999 20060728; WO2007US73649 20070717
AP	- CA20072657244 20070717
DT	- I
CCI	- B29D11/00278 ; B29C61/0616 ; G01K3/04 ; G01K5/483 ; G02B3/0031 ; G02B3/14
PA	- (A1 C) 3M INNOVATIVE PROPERTIES CO [US]
TI	- (A1 C) MICROLENS SHEETING WITH FLOATING IMAGE USING A SHAPE MEMORY MATERIAL
AB	- (A1) A sheeting includes a layer of a shape-memory polymer material having a s urface of microlenses , wherein each of the microlenses



is associated with one of a plurality of images within the sheeting. The layer of the shape-memory polymer material is responsive to an external stimulus; e.g., temperature, solvent, or moisture; by transitioning from a first state in which an optical property of the **microlenses** has a first value to a second state in which the optical property of the **microlenses** has a second value. The **microlenses** have refractive surfaces that transmit light to positions within the sheeting to produce a **composite image** from the images formed within the sheeting when the layer of the shape-memory polymer material is in one of the first state and the second state. At least one of the images is a partially complete **image**, and each of the images is associated with a different one of the microlenses.

- (C)

A sheeting includes a layer of a shape-memory polymer material having a surface of **microlenses**, wherein each of the **microlenses** is associated with one of a plurality of images within the sheeting. The layer of the shape-memory polymer material is responsive to an external stimulus; e.g., temperature, solvent, or moisture; by transitioning from a first state in which an optical property of the **microlenses** has a first value to a second state in which the optical property of the **microlenses** has a second value. The **microlenses** have refractive surfaces that transmit light to positions within the sheeting to produce a **composite image** from the images formed within the sheeting when the layer of the shape-memory polymer material is in one of the first state and the second state. At least one of the images is a partially complete **image**, and each of the images is associated with a different one of the **microlenses**.

PN - [CN101410733](#) A 20090415

PNFP - CN101410733B B 20111228

PR - WO2007US65751
20070402; US20060399695 20060406

AP - CN2007810478 20070402

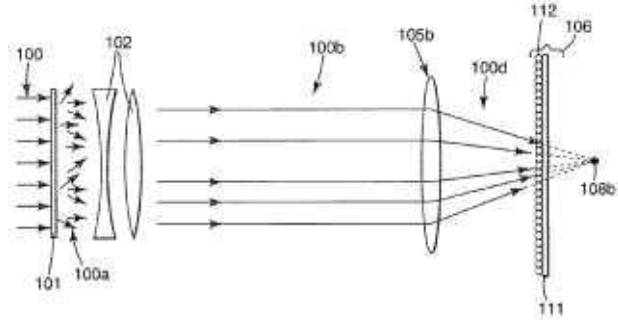
DT - I

CCI - [G02B5/128](#) ; [B44F1/10](#) ;
[G02B3/0006](#) ; [G02B27/2214](#) ;
[G02B27/2292](#)

PA - (A)
3M INNOVATIVE PROPERTIES CO
[US]

TI - (A)
Sheeting with **composite image**
that floats

AB - (A)
Translucent, transparent, or semi-translucent microlens sheetings with **composite images** are disclosed, in which a **composite image** floats above or below the sheeting, or both. The **composite image** may be two-dimensional or three-dimensional. The sheeting may have at least one layer of material having a surface of **microlenses** that form one or more images at positions internal to the layer of material, at least one of the images being a partially complete **image**. Additional layers, such as retroreflective, translucent, transparent, or optical structure layers may also be incorporated into the sheeting.



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PN - [KR20090009790](#) A 20090123

PR - US20060399695 20060406

AP - KR20087024142 20081002

DT - I

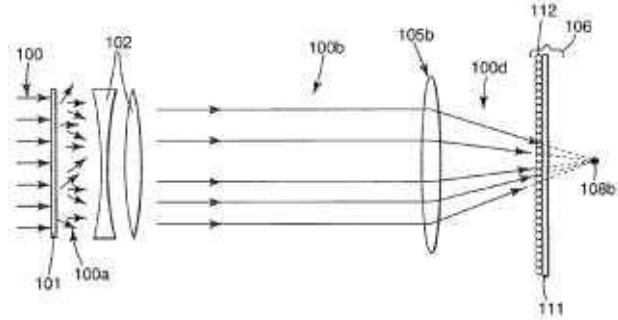
CCI - [B44F1/10](#) ; [G02B3/0006](#) ;
[G02B5/128](#) ; [G02B27/2214](#) ;
[G02B27/2292](#)

CNOI - [G02B3/0006](#) ; [G02B5/128](#) ;
[G02B27/2214](#) ; [G02B27/2292](#)

PA - 3M INNOVATIVE PROPERTIES CO
[US]

TI - SHEETING WITH **COMPOSITE IMAGE** THAT FLOATS

AB - Translucent, transparent, or semi-translucent microlens sheetings with **composite images** are disclosed, in which a **composite image** floats above or below the sheeting, or both. The **composite image** may be two-dimensional or three-dimensional. The



sheeting may have at least one layer of material having a surface of **microlenses** that form one or more images at positions internal to the layer of material, at least one of the images being a partially complete **image**. Additional layers, such as retroreflective, translucent, transparent, or optical structure layers may also be incorporated into the sheeting.

50/73	© EPODOC / EPO
PN	- WO2009009258 A2 20090115
PNFP	- WO2009009258 A3 20090416
PR	- US20070949092P 20070711
AP	- WO2008US67180 20080617
DT	- *, Rep
CT	- KR ISR (A3) KR20020086566 A 00000000 [X] (3M INNOVATIVE PROPERTIES CO.); US4200875 A 19800429 [A] (GALANOS DEMOSTHENES G [US]); US4082426 A 19780404 [A] (BROWN ROBERT A)
CCI	- G02B27/2214 ; G02B27/2292 ; G03B21/62
PA	- (A2 A3) 3M INNOVATIVE PROPERTIES CO [US]; HERBERT SAMMUEL D [US]; STUDINER CHARLES J IV [US]; SMITHSON ROBERT L W [US]; KRASA ROBERT T [US]; WU PINGFAN [US]; DUNN DOUGLAS S [US]; DOLEZAL MICHAEL W [US]
TI	- (A2 A3) SHEETING WITH COMPOSITE IMAGE THAT FLOATS
AB	- (A2 A3) Techniques are described for forming microlens sheeting having composite images that appear to float with respect to the plane of the sheeting. As one example, a method comprises forming one or more images within a sheeting having a surface of microlenses , wherein at least one of the images is a partially complete image , and wherein each of the images is associated with a different one of the microlenses , wherein the microlenses have refractive surfaces that transmit light to positions within the sheeting to produce a plurality of composite images from the images formed

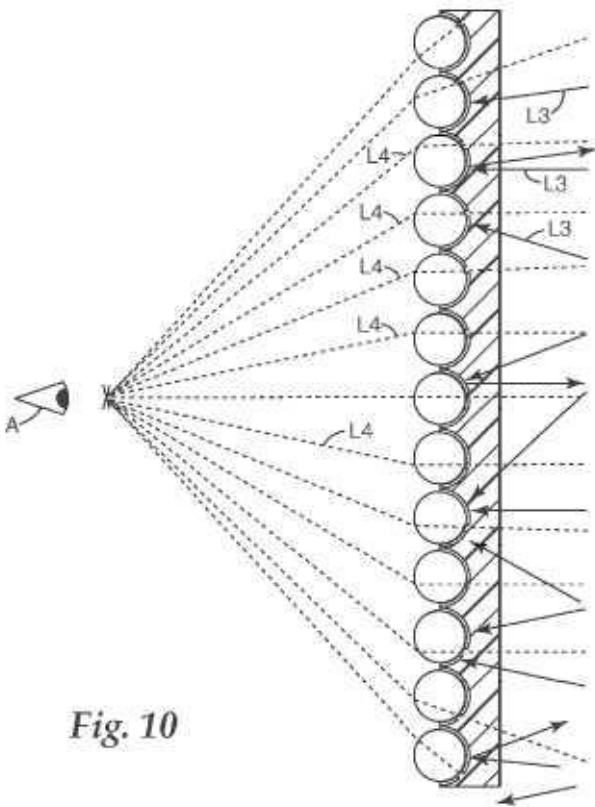


Fig. 10

within the sheeting so that each of the **composite** images appears to float with respect to the plane of the sheeting, and wherein forming the one or more images comprises forming the one or more images such that each of the **composite** images is associated with a different viewing angle range.

- 51/73 © EPODOC / EPO
- PN

- CA2645573 A1 20071011
- PNFP

- CA2645573 C 20140617
- PR

- US20060399695
20060406; WO2007US65751
20070402
- AP

- CA20072645573 20070402
- DT

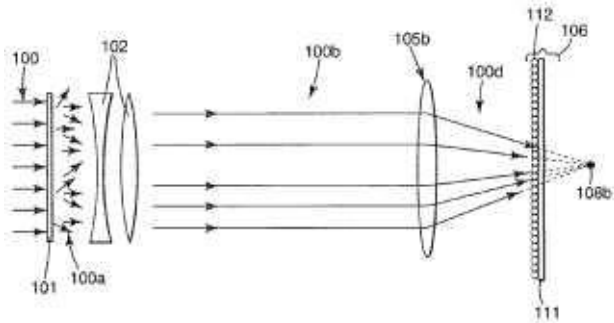
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- CCI

- B44F1/10 ; G02B3/0006 ;
G02B5/128 ; G02B27/2214 ;
G02B27/2292
- PA

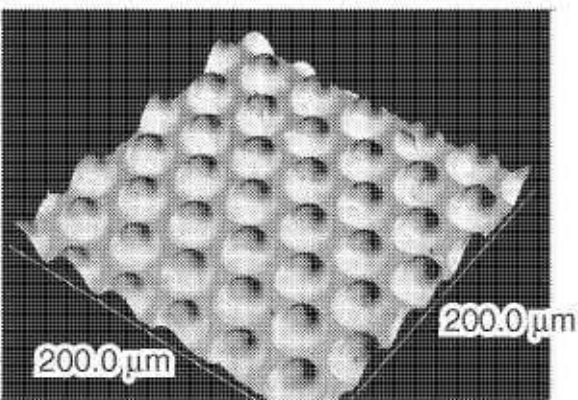
- (A1 C)
3M INNOVATIVE PROPERTIES CO
[US]
- TI

- (A1 C)
SHEETING WITH **COMPOSITE**
IMAGE THAT FLOATS
- AB

- (C)
Translucent, transparent, or semi-translucent microlens sheetings with **composite** images are disclosed, in which a **composite image** floats above or below the sheeting, or both. The **composite image** may be two-dimensional or three-dimensional. The sheeting may have at least one layer of material having a surface of **microlenses** that form one or more images at positions internal to the layer of material, at least one of the images being a partially complete **image**. Additional layers, such as retroreflective, translucent, transparent, or optical structure layers may also be incorporated into the sheeting.



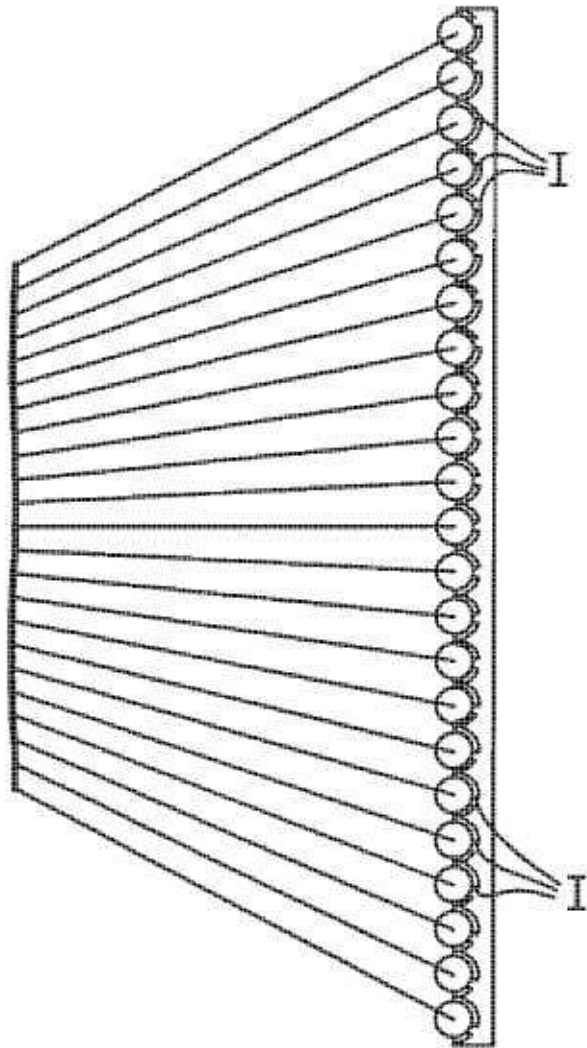
PN	- WO2008014142 A2 20080131
PNFP	- WO2008014142 A3 20100218
PR	- US20060495999 20060728
AP	- WO2007US73649 20070717
DT	- *; Rep
CT	- KR ISR (A3) JPH0976245 A 19970325 [A] (NIPPON COLUMBIA); WO9814803 A1 19980409 [A] (MINNESOTA MINING & MFG [US]); US2005275946 A1 20051215 [A] (CHOO HYUCK [US], et al)
CCI	- B29D11/00278 ; B29C61/0616 ; G01K3/04 ; G01K5/483 ; G02B3/0031 ; G02B3/14
PA	- (A2 A3) 3M INNOVATIVE PROPERTIES CO [US]
TI	- (A2 A3) MICROLENS SHEETING WITH FLOATING IMAGE USING A SHAPE MEMORY MATERIAL
AB	- (A2 A3) A sheeting includes a layer of a shape-memory polymer material having a surface of microlenses , wherein each of the microlenses is associated with one of a plurality of images within the sheeting. The layer of the shape- memory polymer material is responsive to an external stimulus; e.g., temperature, solvent, or moisture; by transitioning from a first state in which an optical property of the microlenses has a first value to a second state in which the optical property of the microlenses has a second value. The microlenses have refractive surfaces that transmit light to positions within the sheeting to produce a composite image from the images formed within the sheeting when the layer of the shape-memory polymer material is in one of the first state and the second state. At least one of the images is a partially complete image , and each of the images is associated with a different one of the microlenses .



PA	- (A2 A3) SEARETE LLC [US]; HILLIS W DANIEL [US]; MYHRVOLD NATHAN P [US]; WOOD LOWELL L JR [US]
TI	- (A2 A3) IMAGE CORRECTION USING INDIVIDUAL MANIPULATION OF MICROLENSSES IN A MICROLENS ARRAY
AB	- (A2 A3) A system constructs a composite image using focus assessment information of image regions.

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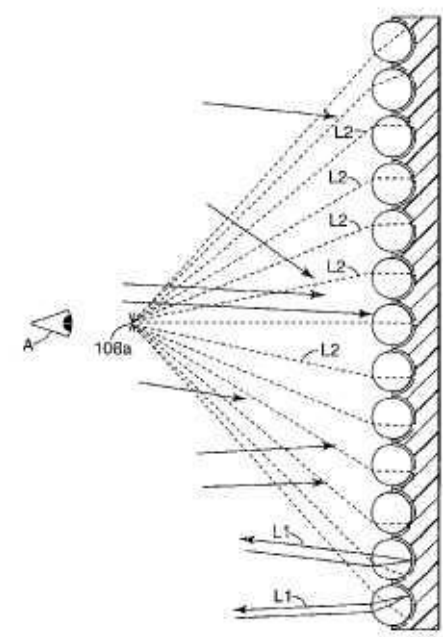
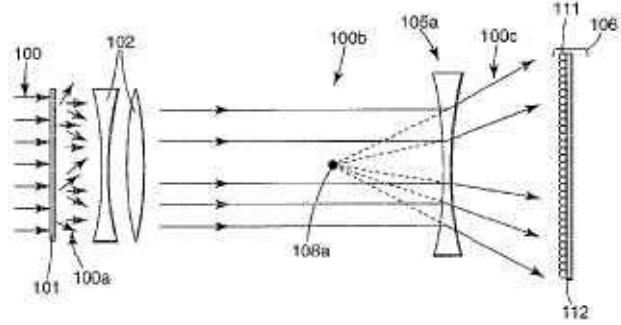
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PR	- US20070960837 20071220; US20060399695 20060406; US20010898580 20010703; US20000510428 20000222
AP	- US20070960837 20071220
DT	- **
CT	- STSE (B2) US3530779 A 19700929 [] (JOHN W ALOFS) US4367920 A 19830111 [] (MINNESOTA MINING & MFG) US4920039 A 19900424 [] (DENNISON MFG CO [US]) US2007081254 A1 20070412 [] (3M INNOVATIVE PROPERTIES CO) - R141 (A1) US3365350 A []; US4367920 A []; US4424990 A []; US4634220 A []; US4799739 A []; US4892336 A []; US5279912 A []; US5594841 A []; US5706133 A []; US5712731 A []; US5856061 A []; US6177217 B1 []; US2008023890 A1 []; US2008024872 A1 []; US2008027199 A1 []; US3306974 A []; US4315665 A []; US5091483 A []; US5491045 A []; US5717844 A []; US6028621 A []; US2004038822 A1 []; US2006029753 A1 []; US7336422 B2 []; US2500511 A []; US3503315 A []; US4650283 A []; US4732453 A []; US5889118 A [];



[US6197474](#) B1 [];
[US2005057812](#) A1 [];
[US1905716](#) A [];
[US2279825](#) A [];
[US3801183](#) A [];
[US4082426](#) A [];
[US4200875](#) A [];
[US4920039](#) A [];
[US5105206](#) A [];
[US5506300](#) A [];
[US5744291](#) A [];
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[US2008130126](#) A1 [];
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[US6110645](#) A [];
[US6781733](#) B1 [];
[US7253958](#) B2 [];

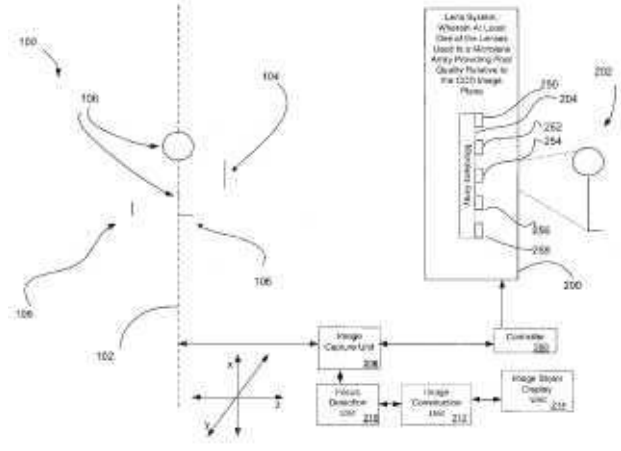
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CCI	- B44F1/10 ; G02B3/0006 ; G02B5/128 ; G02B27/2214 ; G02B27/2292
PA	- (A1) 3M INNOVATIVE PROPERTIES CO - (B2) DUNN DOUGLAS S [US]; SMITHSON ROBERT L W [US]; KRASA ROBERT T [US]; DOLEZAL MICHAEL W [US]; FLORCZAK JEFFREY M [US]; MAKI STEPHEN P [US]; OSGOOD III RICHARD M [US]
TI	- (A1 B2) SHEETING WITH COMPOSITE IMAGE THAT FLOATS
AB	- (A1 B2) Translucent, transparent, or semi- translucent microlens sheetings with composite images are disclosed, in which a composite image floats above or below the sheeting, or both. The composite image may be two-dimensional or three-dimensional. The sheeting may have at least one layer of material having a surface of microlenses that form one or more images at positions internal to the layer of material, at least one of the images being a partially complete image . Additional layers, such as retroreflective, translucent, transparent, or optical structure layers may also be incorporated into the sheeting.

- PN - [US2002054434](#) A1 20020509
- PNFP - US7068434 B2 20060627
- PR - US20010898580
20010703; US20000510428 20000222
- AP - US20010898580 20010703
- DT - *: Rep
- CT - || R141 (A1)
[US5712731](#) A []
- CCI - [G02B5/128](#) ; [G02B27/106](#) ;
[G02B27/1066](#) ; [G02B27/123](#) ;
[G02B27/2214](#) ; [G02B27/2292](#)
- CCA - [A41D27/08](#) ; [A41D31/0088](#) ;
[B41M3/003](#) ; [B41M3/148](#)
- PA - (A1 B2)
3M INNOVATIVE PROPERTIES CO
[US]
- TI - (A1 B2)
Sheeting with **composite image**
that floats
- AB - (A1 B2)
Microlens sheetings
with **composite images** are
disclosed, in which the **composite
image** floats above or below the
sheeting, or both. The **composite
image** may be two-dimensional
or three-dimensional. Methods
for providing such an imaged
sheeting, including by the
application of radiation to a
radiation sensitive material
layer adjacent the **microlenses**,
are also disclosed.



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- PN - [US2005157395](#) A1 20050721
- PNFP - US6967780 B2 20051122
- PR - US20040764431 20040121
- AP - US20040764431 20040121
- DT - *: Rep
- CT - || STSE (B2)
[US6088083](#) A 20000711 [] (MEIER
HANS-JUERGEN [DE])
[US2002114077](#) A1 20020822 [] (JAVIDI
BAHRAM [US])
- || R141 (A1)
[US2003071969](#) A1 [] ;
[US2003098352](#) A1 [] ;
[US6088083](#) A [] ;
[US2002114077](#) A1 [] ;
[US5451766](#) A []
- CCI - [G02B3/0056](#) ; [G06T5/50](#)
- CCA - [G02B3/0006](#) ; [G02B3/04](#)
- PA - (B2)
SEARETE LLC [US]
- TI - (A1 B2)
Image correction using individual
manipulation of **microlenses** in a
microlens array



AB - (A1 B2)
 A system constructs a **composite image** using focus assessment information of **image** regions.

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PN - [US6288842](#) B1 20010911

PR - US20000510428 20000222

AP - US20000510428 20000222

DT - **

CT - || STSE (B1)
[US4034555](#) A 19770712 [] (ROSENTHAL BRUCE A);
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[US5642226](#) A 19970624 [] (ROSENTHAL BRUCE A [US]);
[US5896230](#) A 19990420 [] (GOGGINS TIMOTHY P [US]);
[US6084713](#) A 20000704 [] (ROSENTHAL BRUCE A [US])

CCI - [G02B5/128](#) ; [G02B27/2292](#)

PA - 3M INNOVATIVE PROPERTIES CO [US]

TI - Sheeting with **composite image** that floats

AB - Microlens sheetings with **composite** images are disclosed, in which the **composite image** floats above or below the sheeting, or both. The **composite image** may be two-dimensional or three-dimensional. Methods for providing such an imaged sheeting, including by the application of radiation to a radiation sensitive material layer adjacent the **microlenses**, are also disclosed.

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PN - [US2008024872](#) A1 20080131

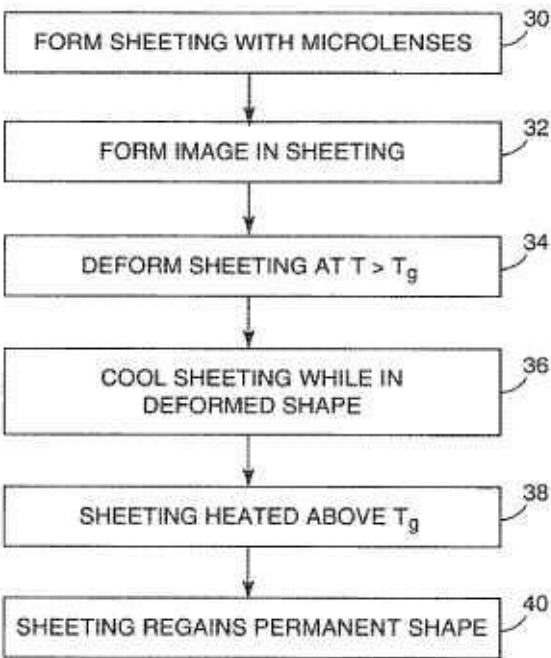
PNFP - US7586685 B2 20090908

PR - US20060495999 20060728

AP - US20060495999 20060728

DT - **

CT - || R141 (A1)
[US3365350](#) A 19680123 [] (LEO CAHN);
[US4424990](#) A 19840110 [] (WHITE LAWRENCE J [US], et al);
[US4634220](#) A 19870106 [] (HOCKERT ERIC N [US], et al);
[US4799739](#) A 19890124 [] (NEWSWANGER CRAIG [US]);
[US5279912](#) A 19940118 [] (TELFER STEPHEN J [US], et al);
[US5594841](#) A 19970114 [] (SCHUTZ STEPHEN A [US]);
[US5712731](#) A 19980127 [] (DRINKWATER KENNETH J [GB], et al);
[US5856061](#) A 19990105 [] (PATEL RANJAN C [GB], et al);
[US3306974](#) A 19670228 [] (CUNNALLY WILLIAM T);
[US4315665](#) A 19820216 [] (HAINES KENNETH A);
[US5091483](#) A 19920225 [] (MAZUREK MIECZYSLAW H [US], et al);
[US5491045](#) A 19960213 [] (DEBOER CHARLES D [US], et al);
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[US5717844](#) A 19980210 [] (LO ALLEN KWOK WAH [US], et al);
[US2500511](#) A 19500314 [] (MAURICE BONNET);
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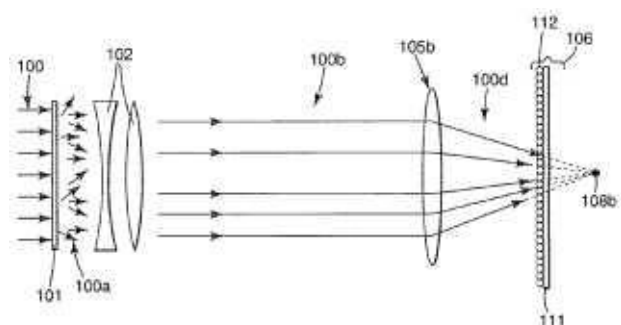
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DE);
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[US5639580](#) A 19970617 [
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[US]);
[US5642226](#) A 19970624 [
] (ROSENTHAL BRUCE A [US]);
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] (STARAL JOHN S [US], et al);
[US7068434](#) B2 20060627 [
] (FLORCZAK JEFFREY M [US], et al);
[US1918705](#) A 19330718 [] (IVES
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[US3676130](#) A 19720711 [
] (BURCKHARDT CHRISTOPH B, et
al);
[US4034555](#) A 19770712 [
] (ROSENTHAL BRUCE A);
[US4099838](#) A 19780711 [] (COOK
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[US5330799](#) A 19940719 [
] (SANDOR ELLEN R [US], et al);
[US5644431](#) A 19970701 [] (MAGEE
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] (ROSENTHAL BRUCE A [US]);
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] (AGRONIN MICHAEL L [US]);
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] (KOBAYASHI MASANORI [JP], et
al);
[US2326634](#) A 19430810 [
] (GEBHARD MELVIN L, et al);
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[US3751258](#) A 19730807 [] (HOPPE
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[US4688894](#) A 19870825 [
] (HOCKERT ERIC N [US]);
[US5935758](#) A 19990810 [] (PATEL
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[US3607273](#) A 19710921 [] (KINNEY
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] (ROSENTHAL BRUCE A [US]);
[US4541830](#) A 19850917 [] (HOTTA
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[US4691993](#) A 19870908 [] (PORTER

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[US5244288](#) A 19930914 [
] (NAGAOKA HIDEJI [JP], et al);
[US5449597](#) A 19950912 [
] (SAWYER GEORGE M [US]);
[US5554432](#) A 19960910 [
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[US5671089](#) A 19970923 [] (ALLIO
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] (FLORCZAK JEFFREY M [US], et al);
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 al);
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] (DEBOER CHARLES D [US]);
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 MARK K [US], et al);
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 ALLEN KWOK WAH [US], et al);
[US5681676](#) A 19971028 [] (TELFER
 STEPHEN J [US], et al);
[US2002145807](#) A1 20021010 [
] (NISHIKAWA TAKAO [JP]);
[US6468715](#) B2 20021022 [
] (HOFFEND JR THOMAS R [US], et
 al);
[US7278739](#) B2 20071009 [
] (SHADDUCK JOHN H [US]);
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] (NORDGREN ORVILLE J);
[US4552442](#) A 19851112 [] (STREET
 GRAHAM S B [GB]);
[US4708920](#) A 19871124 [
] (ORENSTEEN BRUCE D [US], et
 al);
[US4783141](#) A 19881108 [] (BABA
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[US4420527](#) A 19831213 [] (CONLEY
 KENNETH E [US]);
[US4783141](#) A 19881108 [] (BABA
 TAKESHI [JP], et al);
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] (NOMURA TOSHIO [JP], et al);

- | | |
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| | <p>US7245430 B2 20070717 [] (KOBAYASHI MASANORI [JP], et al);</p> <p>US7253958 B2 20070807 [] (AIZENBERG JOANNA [US], et al);</p> <p>US2002054434 A1 20020509 [] (FLORCZAK JEFFREY M [US], et al);</p> <p>US2002145807 A1 20021010 [] (NISHIKAWA TAKAO [JP])</p> |
| CCI | - B29D11/00278 ; B29C61/0616 ; G01K3/04 ; G01K5/483 ; G02B3/0031 ; G02B3/14 |
| PA | - (A1)
3M INNOVATIVE PROPERTIES CO |
| TI | - (A1 B2)
Microlens sheeting with floating image using a shape memory material |
| AB | - (A1 B2)
A sheeting includes a layer of a shape-memory polymer material having a surface of microlenses , wherein each of the microlenses is associated with one of a plurality of images within the sheeting. The layer of the shape-memory polymer material is responsive to an external stimulus; e.g., temperature, solvent, or moisture; by transitioning from a first state in which an optical property of the microlenses has a first value to a second state in which the optical property of the microlenses has a second value. The microlenses have refractive surfaces that transmit light to positions within the sheeting to produce a composite image from the images formed within the sheeting when the layer of the shape-memory polymer material is in one of the first state and the second state. At least one of the images is a partially complete image , and each of the images is associated with a different one of the microlenses . |

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- PN - [US2006262411](#) A1 20061123
- PNFP - US7336422 B2 20080226
- PR - US20060399695
20060406; US20010898580
20010703; US20000510428 20000222
- AP - US20060399695 20060406
- DT - *; Rep
- CT - || STSE (B2)
[US6212805](#) B1 20010410 [] (HILL



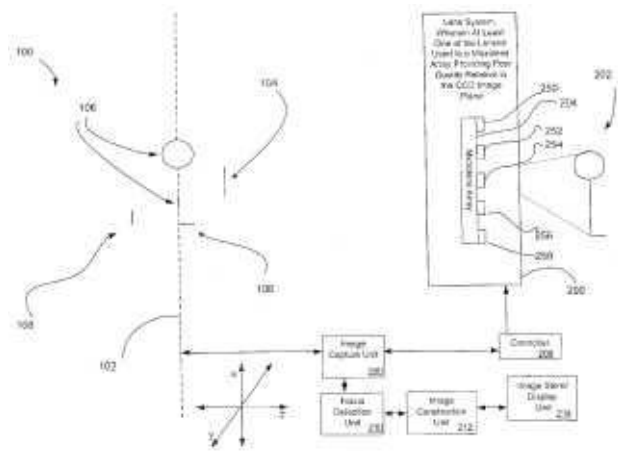
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RUFUS BUTLER [US])

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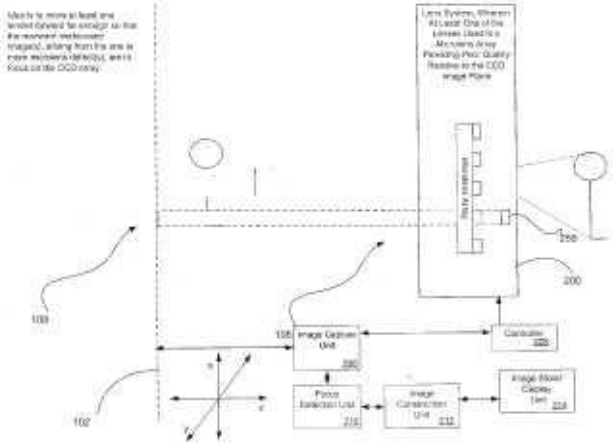
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CCI	- B44F1/10 ; G02B3/0006 ; G02B5/128 ; G02B27/2214 ; G02B27/2292
PA	- (A1 B2) 3M INNOVATIVE PROPERTIES CO [US]
TI	- (A1 B2) Sheeting with composite image that floats
AB	- (A1 B2) Translucent, transparent, or semi-translucent microlens sheetings with composite images are disclosed, in which a composite image floats above or below the sheeting, or both. The composite image may be two-dimensional or three-dimensional. The sheeting may have at least one layer of material having a surface of microlenses that form one or more images at positions internal to the layer of material, at least one of the images being

a partially complete **image**.
Additional layers, such as
retroreflective, translucent,
transparent, or optical structure
layers may also be incorporated
into the sheeting.

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PNFP	- US7417797 B2 20080826
PR	- US20050221350 20050907; US20030738626 20031216; US20040764340 20040121; US20040764431 20040121
AP	- US20050221350 20050907
DT	- *, Rep
CT	- STSE (B2) US6088083 A 10000711 [] (ZEISS STIFTUNG [DE]) US2002114077 A1 20020822 [] (JAVIDI BAHRAM [US]) - R141 (A1) US4141032 A []; US7012757 B2 []; US4584704 A []; US5751863 A []; US2006098861 A1 []; US7046401 B2 []; US6088083 A []; US2005157394 A1 []; US2002114077 A1 []; US5451766 A []; US2002176011 A1 []; US6967780 B2 []; US5581637 A []; US2002181762 A1 []
CCI	- G02B27/0075 ; G02B3/0043 ; G02B26/0875 ; G02B27/16 ; G02B27/0068
PA	- (A1) SEARETE LLC - (B2) SEARETE LLC [US]
TI	- (A1 B2) Image correction using individual manipulation of microlenses in a microlens array
AB	- (A1 B2) A system constructs a composite image using focus assessment information of image regions.

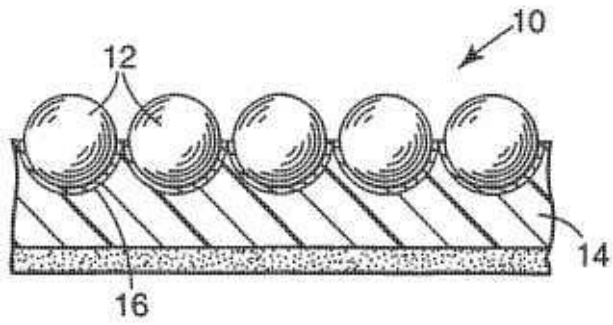


- PN - [US2008218868](#) A1 20080911
- PNFP - US7826139 B2 20101102
- PR - US20080072497
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20040121; US20040764431
20040121; US20050221350 20050907
- AP - US20080072497 20080225
- DT - *: Rep
- CT - || STSE (B2)
[US2002114077](#) A1 20020822 [] (JAVIDI BAHRAM [US])
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[US5943050](#) A [];
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- CCI - [G02B27/0025](#) ; [G06T5/50](#) ;
[H04N5/23212](#) ; [H04N5/23232](#) ;
[H04N5/2356](#)
- PA - (A1)
SEARETE LLC
- (B2)
INVENTION SCIENCE FUND I LLC
[US]
- TI - (A1 B2)
Image correction using individual manipulation of **microlenses** in a microlens array
- AB - (A1 B2)
A system constructs a **composite image** using focus assessment information of **image** regions.



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- PN - [WO03005075](#) A1 20030116
- PR - US20010898580 20010703
- AP - WO2002US21165 20020702
- DT - **
- CT - |EP| ISR (A1)
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[PX] (FLORCZAK JEFFREY M [US], et al)
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[PX] (FLORCZAK JEFFREY M [US], et al)
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[AD] (BROWN ROBERT A)
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[A] - PAI V M ET AL, "Microscopic flow visualization system for fluids in magnetic field", JOURNAL OF MAGNETISM AND MAGNETIC MATERIALS, ELSEVIER



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- CCI - [G02B5/128](#) ; [G02B27/106](#) ;
[G02B27/1066](#) ; [G02B27/123](#) ;
[G02B27/2214](#) ; [G02B27/2292](#)
- CCA - [A41D27/08](#) ; [A41D31/0088](#) ;
[B41M3/003](#) ; [B41M3/148](#)
- PA - 3M INNOVATIVE PROPERTIES CO
[US]
- TI - MICROLENS SHEETING
WITH **COMPOSITE IMAGE** THAT
APPEARS TO FLOAT
- AB - Microlens sheetings
with **composite** images are
disclosed, in which the **composite**
image floats above or below the
sheeting, or both. The **composite**
image may be two-dimensional
or three-dimensional. Methods
for providing such an imaged
sheeting, including by the
application of radiation to a
radiation sensitive material
layer adjacent the **microlenses**,
are also disclosed.

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- PN - [WO0163341](#) A1 20010830
- PR - US20000510428 20000222
- AP - WO2000US16954 20000620
- DT - *; Rep
- CT - |EP| ISR (A1)
[US4200875](#) A 19800429 [DA] (GALANOS DEMOSTHENES G [US])
[DA] 1,25
* column 2, line 58 - column 4, line 55; figures 1-4 *;
[US4082426](#) A 19780404 [DA] (BROWN ROBERT A)
[DA] 1,25
* column 2, line 39 - column 3, line 27; figures 1,2 *;
[EP0583766](#) A1 19940223 [A] (EASTMAN KODAK CO [US])
[A] 1,25
* column 2, line 37 - column 3, line 54; figures 1,2 *;
[WO8303019](#) A1 19830901 [A] (KASSIES MICHIEL)
[A] 1,25
* page 12, line 19 - page 15, line 8; figures 2,3A-3C *
- CCI - [G02B5/128](#) ; [G02B27/2292](#)
- PA - 3M INNOVATIVE PROPERTIES CO [US]
- TI - SHEETING WITH **COMPOSITE IMAGE** THAT FLOATS
- AB - Microlens sheetings with **composite** images are disclosed, in which the **composite image**
floats above or below the sheeting, or both. The **composite image** may be two-
dimensional or three-dimensional. Methods for providing such an imaged sheeting,
including by the application of radiation to a radiation sensitive material layer adjacent
the **microlenses**, are also disclosed.

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- PN - [TW522257B](#) B 20030301
- PR - US20000510428 20000222

AP - TW20010102353 20010205
DT - I
CCI - [G02B5/128](#) ; [G02B27/2292](#)
PA - 3M INNOVATIVE PROPERTIES CO [US]
TI - Sheetting with **composite image** that floats
AB - Microlens sheetings with **composite** images are disclosed, in which the **composite image** floats above or below the sheetting, or both. The **composite image** may be two-dimensional or three-dimensional. Methods for providing such an imaged sheetting, including by the application of radiation to a radiation sensitive material layer adjacent the **microlenses**, are also disclosed.

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PN - [NZ520890](#) A 20030429
PR - US20000510428 20000222; WO2000US16954 20000620
AP - NZ20000520890 20000620
DT - I
CCI - [G02B5/128](#) ; [G02B27/2292](#)
PA - 3M INNOVATIVE PROPERTIES CO
TI - Sheetting with **composite image** that floats
AB - Microlens sheetings with **composite** images are disclosed, in which the **composite image** floats above or below the sheetting, or both. The **composite image** may be two-dimensional or three-dimensional. Methods for providing such an imaged sheetting, including by the application of radiation to a radiation sensitive material layer adjacent the **microlenses**, are also disclosed.

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PR - US20010898580 20010703; WO2002US21165 20020702
AP - MX2003PA11729 20020702
DT - I
CCI - [G02B5/128](#) ; [G02B27/106](#) ; [G02B27/1066](#) ; [G02B27/123](#) ; [G02B27/2214](#) ; [G02B27/2292](#)
CCA - [A41D27/08](#) ; [A41D31/0088](#) ; [B41M3/003](#) ; [B41M3/148](#)
PA - 3M INNOVATIVE PROPERTIES CO [US]
TI - MICROLENS SHEETING WITH **COMPOSITE IMAGE** THAT APPEARS TO FLOAT.
AB - Microlens sheetings with **composite** images are disclosed, in which the **composite image** floats above or below the sheetting, or both. The **composite image** may be two-dimensional or three-dimensional. Methods for providing such an imaged sheetting, including by the application of radiation to a radiation sensitive material layer adjacent the **microlenses**, are also disclosed.

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PN - [MXPA02008143](#) A 20030128
PR - US20000510428 20000222; WO2000US16954 20000620
AP - MX2002PA08143 20000620
DT - I
CCI - [G02B5/128](#) ; [G02B27/2292](#)
PA - 3M INNOVATIVE PROPERTIES CO [US]
TI - SHEETING WITH **COMPOSITE IMAGE** THAT FLOATS.
AB - Microlens sheetings with **composite** images are disclosed, in which the **composite image** floats above or below the sheetting, or both. The **composite image** may be two dimensional or three dimensional. Methods for providing such an imaged sheetting, including by the application of radiation to a radiation sensitive material layer adjacent the **microlenses**, are also disclosed.

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- PR

- JP20000291953 20000921
- AP

- WO2001JP08268 20010921
- DT

- *; Rep
- CT

- [JP] ISR (A1)

[JPH10221642](#) A 19980821

[Y] (HITACHI LTD);

[US6081380](#) A 20000627

[Y] (OHSHIMA TETSUYA [JP], et al);

[JPS6424336U](#) U 19890209 [Y];

[JPH01151680U](#) U 19891019 [Y];

[JPS63259631](#) A 19881026

[Y] (DAINIPPON PRINTING CO LTD);

[JPH02170150](#) A 19900629 [Y] (SONY CORP);

[JPH02306231](#) A 19901219

[Y] (KURARAY CO);

[JPH0354544](#) A 19910308 [Y] (SEIKO EPSON CORP);

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[JPH04355442](#) A 19921209

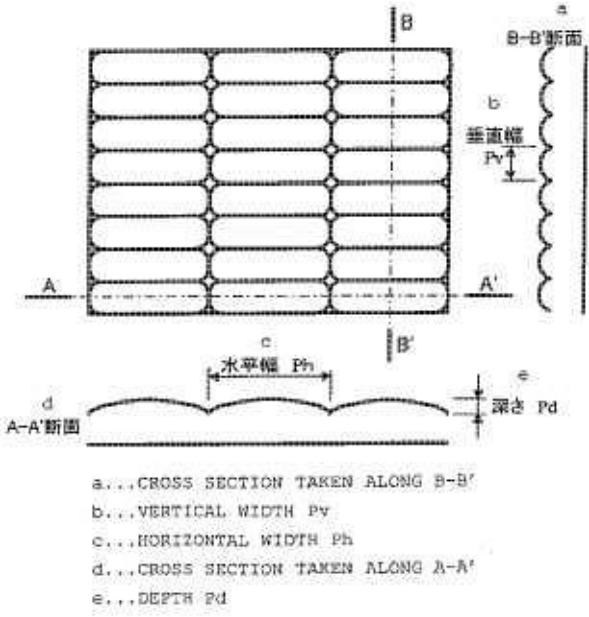
[Y] (DAINIPPON PRINTING CO LTD)
- CCI

- [G03B21/60](#)
- PA

- HITACHI LTD [JP]; OSHIMA TETSUYA [JP]; KANEKO HIROKI [JP]; TSUJI KAZUTAKA [JP]; ARIMOTO AKIRA [JP]; EBINA OSAMU [JP]; YATSU MASAHIKO [JP]
- TI

- **IMAGE** DISPLAY
- AB

- An **image** display comprising a conventional **composite** mirror and having a wide viewing angle in the horizontal direction. A directive reflecting screen has a **composite** mirror and an anisotropic diffuser which are so arranged that the input light beam is transmitted through the anisotropic diffuser, reflected from the **composite** mirror, transmitted through the anisotropic diffuser, and emerges from the anisotropic diffuser. The anisotropic diffuser is composed of **microlenses** having a width parallel to the ridges of the **composite** mirror and different from the width perpendicular to the ridges.



- 70/73

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- PN

- [IE200000001](#) A1 20000920
- PR

- IE200000000001 20000104; IE199900000004 19990104
- AP

- IE200000000001 20000104
- DT

- I
- PA

- MCCABE EITHNE [IE]
- TI

- Optical imaging systems

AB - A confocal microscope (1) includes an objective lens (2). An optical fibre bundle (3) is mounted behind the objective lens (2) and comprises a plurality of individual optical fibres (4). Each optical fibre (4) has an outer end (5) and an inner end (6). A lens array (7) is mounted spaced apart from the inner end (6) of the optical fibres (4). The lens array (7) comprises a number of **microlenses** (8), each optical fibre (4) having an associated microlens (8). Means is provided for applying a voltage to each microlens (8) for switching the microlens (8) into or out of focus with an inner end of its associated optical fibre (4). When in focus an **image** from an object being viewed is transmitted via a beam splitter (10) (11,12) to a photodetector (14). The photodetector (14) can be connected to any suitable means for displaying or recording the **image**. A controller is operable for sequentially applying focusing voltage to a number of sets of spaced-apart **microlenses** (8) to collect images of portions of an object (16) being viewed which images are then assembled to form a **composite image** of the object (16). <Figure 4>

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PNFP - EP1602946 B1 20111026

PR - EP20020749782
20020702; US20010898580 20010703

AP - EP20050014233 20020702

DT - **

CT - || STSE (A1)
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[XDY] (GEBHARD MELVIN L, et al)
[XD] 1-5,12,13
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[Y] 6-11;
[WO9937949](#) A1 19990729
[XY] (JENMAR VISUAL SYSTEMS
[US])
[X] 1-5,12,13
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[Y] 6-11;
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[Y] (MINNESOTA MINING & MFG
[US])
[Y] 6,8-11
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[US5712731](#) A 19980127
[Y] (DRINKWATER KENNETH J [GB],
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CCI - [G02B5/128](#) ; [G02B27/106](#) ;
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CCA - [A41D27/08](#) ; [A41D31/0088](#) ;
[B41M3/003](#) ; [B41M3/148](#)

PA - (A1 B1)
3M INNOVATIVE PROPERTIES CO
[US]

TI - (A1 B1)
Method for attaching a microlens
sheeting to a finished article
then recording a **composite image**
so that it appears to float upon
viewing

AB - (A1)
Microlens sheetings
with **composite** images are
disclosed, in which the **composite**

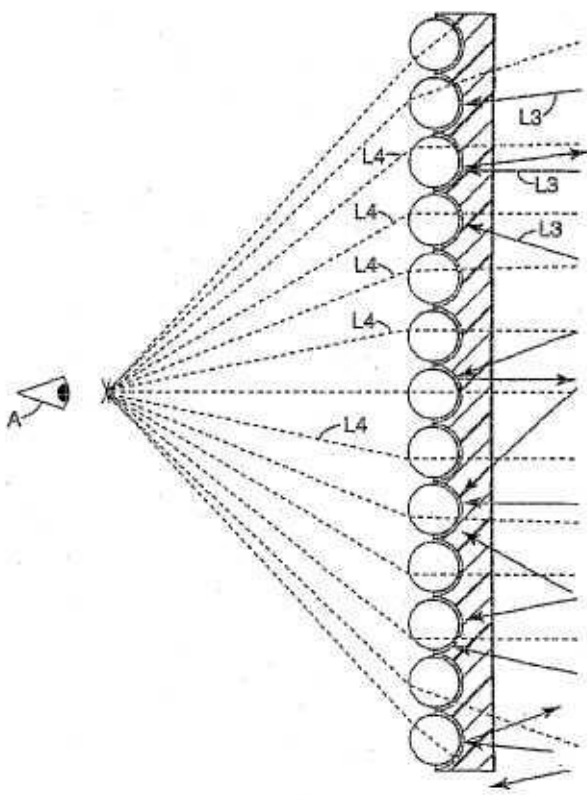


Fig. 10

image floats above or below the sheeting, or both. The composite image may be two-dimensional or three-dimensional. Methods for providing such an imaged sheeting, including by the application of radiation to a radiation sensitive material layer adjacent the microlenses, are also disclosed. <IMAGE>

- 72/73 © EPODOC / EPO
- PN

- CA2452718 A1 20030116
- PNFP

- CA2452718 C 20101026
- PR

- US20010898580
20010703; WO2002US21165
20020702
- AP

- CA20022452718 20020702
- DT

- I
- CCI

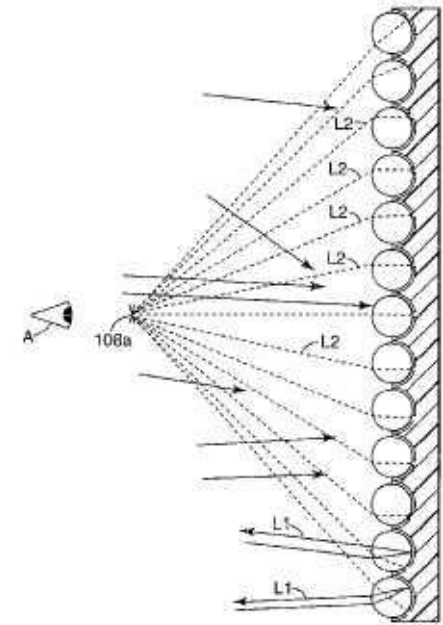
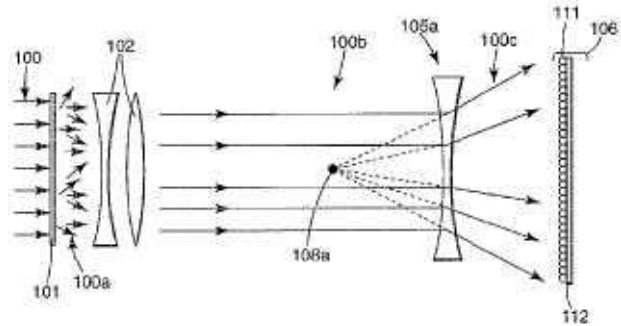
- G02B5/128 ; G02B27/106 ;
G02B27/1066 ; G02B27/123 ;
G02B27/2214 ; G02B27/2292
- CCA

- A41D27/08 ; A41D31/0088 ;
B41M3/003 ; B41M3/148
- PA

- (A1 C)
3M INNOVATIVE PROPERTIES CO
[US]
- TI

- (A1 C)
MICROLENS SHEETING
WITH **COMPOSITE IMAGE** THAT
APPEARS TO FLOAT
- AB

- (A1)
Microlens sheetings
with **composite** images are
disclosed, in which the **composite
image** floats above or below the
sheeting, or both. The **composite
image** may be two-dimensional
or three-dimensional. Methods
for providing such an imaged
sheeting, including by the application
of radiation to a radiation sensitive
material layer adjacent the **microlenses**,
are also disclosed.</SDOA B>
- (C)
Microlens sheetings
with **composite** images are
disclosed, in which the **composite
image** floats above or below the
sheeting, or both. The **composite
image** may be two-dimensional
or three-dimensional. Methods
for providing such an imaged
sheeting, including by the application
of radiation to a radiation sensitive
material layer adjacent the **microlenses**,
are also disclosed.



PN	- CA2400894 A1 20010830	
PNFP	- CA2400894 C 20101005	
PR	- US20000510428 20000222; WO2000US16954 20000620	
AP	- CA20002400894 20000620	
DT	- I	
CCI	- G02B5/128 ; G02B27/2292	
PA	- (A1 C) 3M INNOVATIVE PROPERTIES CO [US]	
TI	- (A1 C) SHEETING WITH COMPOSITE IMAGE THAT FLOATS	
AB	- (A1) Microlens sheetings with composite images are disclosed, in which the composite image floats above or below the sheeting, or both. The composite image may be two-dimensional or three-dimensional. Methods for providing such an imaged sheeting, including by the application of radiation to a radiation sensitive material layer adjacent the microlenses , are also disclosed.</SDOA B> - (C) Microlens sheetings with composite images are disclosed, in which the composite image floats above or below the sheeting, or both. The composite image may be two-dimensional or three-dimensional. Methods for providing such an imaged sheeting, including by the application of radiation to a radiation sensitive material layer adjacent the microlenses , are also disclosed.	