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PGT

Industria y Comercio

SUPERINTENDENCIA

10-95786

SOLICITUD

PATENTE DE INVENCION

SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO



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Tra. 11 PATENTEIYII

Eve: 378 FASENACIONALI

Act. 411 PRESENTACION

Folios: 146

21. EXPEDIENTE Nº

54. TÍTULO ARTÍCULO IMPRESO PARA DESPLEGAR IMÁGENES

QUE TIENEN DEFINICIÓN Y PROFUNDIDAD MEJORADA.

51. CLASIFICACIÓN INTERNACIONAL G02B 27/10

71. SOLICITANTE SERIGRAPH INC

DOMICILIO West Bend, Wisconsin, Estados Unidos de América

74. APODERADO DILIA MARIA RODRIGUEZ D'ALEMAN

22. BOGOTÁ, D.C.

Tatiana Silva C
05-10-2010



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Act. 411 PRESENTACION Folios: 146

**FORMULARIO ÚNICO DE SOLICITUD DE PATENTE
PCT
ENTRADA EN FASE NACIONAL**

SOLICITUD DE:

1

☒

Patente de Invención

☐

Patente de Modelo de Utilidad

☒

Capítulo I.

☐

Capítulo II.

2

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3

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Nacionalidad o domicilio: Estadounidense

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Publicación Internacional No. WO 2009/100193 A1 **Fecha** 13 de agosto de 2009

6 TÍTULO (54) ~~ARTÍCULO IMPRESO PARA DESPLEGAR IMÁGENES QUE TIENEN DEFINICIÓN Y PROFUNDIDAD MEJORADA.~~ *Cambio Título*

Artículos Impresos que despliegan Imágenes y reflejos para producir los mismos.

7 Clasificación Internacional (51)

G02B 27/10

8 Prioridad

SI ☒ NO ☐

(33) País de Origen

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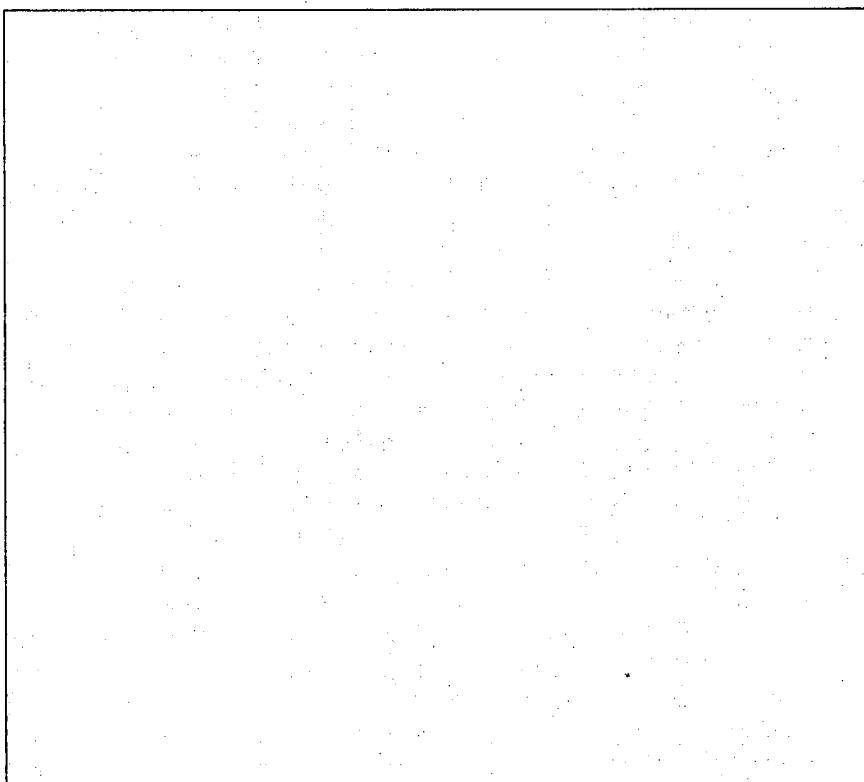
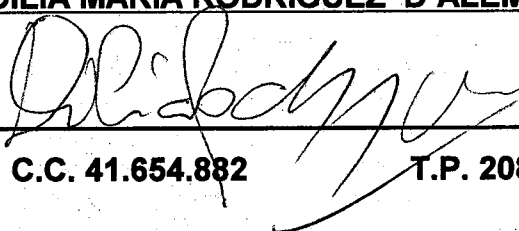
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(31) Número de Solicitud

12/026,069

9 Comprobante de pago No. 10-63,107 // 10-63,113 // 10-63,218 **Fecha** todas de 3 de agosto de 2010

- ☐ Comprobante de pago de la tasa de presentación de la solicitud
- ☐ Documento que acredita la existencia y representación legal cuando el solicitante sea persona jurídica
- ☐ Poderes si fuere el caso
- ☐ Documento de cesión del inventor al solicitante o a su causante
- ☐ Declaraciones
- ☐ Copia de la solicitud internacional. (Resumen, descripción, reivindicaciones, dibujos)
- ☐ Traducción de la solicitud internacional al castellano. (Resumen, descripción, reivindicaciones, dibujos)
- ☐ Copia del examen preliminar internacional efectuado por la Autoridad Internacional de Examen Preliminar (IPEA).
- ☐ Traducción del examen preliminar internacional efectuado por la IPEA
- ☐ De ser el caso copia de contrato de acceso.
- ☐ De ser el caso, documento que acredite la licencia o autorización de uso de conocimientos tradicionales de las comunidades indígenas
- ☐ De ser el caso, certificado de deposito del material biológico
- ☐ Arte final 12 X 12 .
- ☐ De ser el caso, información sobre otras solicitudes de patente o títulos obtenidos en el extranjero por el mismo titular o su causante, relacionadas parcial o totalmente con la invención de esta solicitud.
- ☐ De ser el caso, modificaciones efectuadas a la solicitud internacional
- ☐ Otros

11 FIGURA CARACTERÍSTICA**12 Solicito la concesión de la patente****NOMBRE :** DILIA MARÍA RODRÍGUEZ D'ALEMAN**FIRMA:****C.C. 41.654.882****T.P. 20824**

SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO

NIT : 800176089-2

CERTIFICACION DE EXCEDENTE : 10 - 63,107

FECHA : AGOSTO 3 DE 2010

SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO



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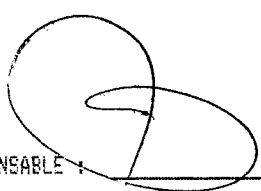
***** CONSIGNACION *****

DEPOSITANTE	TIPO PAGO	BANCO	CUENTA	No. PAGO	FECHA PGO	Vr. PAGO
CLARKE MODET	CONSIGNACION	BANCO DE BOGOTA	062754387	380476084	02/08/2010	94,210,000.00

***** CONCEPTO *****

CANT.	RENTISTICO	CONCEPTO	TOTAL CONCEPTO
1	50005-01-09	OTROS SERVICIOS DE PROPIEDAD I	99 OTROS SERVICIOS ADMINISTRATIVOS
			TOTAL : \$ 500,000.00

SON: QUINIENTOS MIL PESOS

RESPONSABLE : 

RECIBO DE CAJA APLICADO AL EXPEDIENTE No. _____

ESTA CERTIFICACION DE EXCEDENTE DE PAGO SOLO PODRA SER UTILIZADA
COMO PARTE DE LA CANCELACION DE UNA TARIFA VIGENTE Y NO PODRA SER
SUSTITUIDA POR NINGUN RECIBO.

P-2637
2

SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO

NIT : 800176089-2

RECIBO OFICIAL DE CAJA : 10 - 63,113
FECHA : AGOSTO 3 DE 2010

SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO



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***** CONSIGNACION *****

DEPOSITANTE	TIPO PAGO	BANCO	CUENTA	No. PAGO	FECHA PGO	Vr. PAGO
CLARKE MODET	CONSIGNACION	BANCO DE BOGOTA	062754387	380476084	02/08/2010	94,210,000.00

***** CONCEPTO *****

CANT.	RENTISTICO	CONCEPTO	TOTAL CONCEPTO
1	50005-01-01	SOLICITUDES	
		114 PTC CAP-II EXAMEN DE PATENTIBILID	470,000.00
		TOTAL :	\$ 470,000.00

SON: CUATROCIENTOS SETENTA MIL PESOS

RESPONSABLE : _____

RECIBO DE CAJA APLICADO AL EXPEDIENTE No. _____

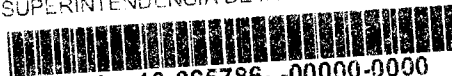
SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO

NIT : 800176089-2

RECIBO OFICIAL DE CAJA : 10 - 63,218

FECHA : AGOSTO 3 DE 2010

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Evs: 378 FASENACIONALI

Act. 411 PRESENTACION

Folios: 146

***** CONSIGNACION *****

DEPOSITANTE	TIPO PAGO	BANCO	CUENTA	No. PAGO	FECHA PGO	Vr. PAGO
CLARKE MODET	CONSIGNACION	BANCO DE BOGOTA	062754387	380476084	02/08/2010	94,210,000.00

***** CONCEPTO *****

CANT.	RENTISTICO	CONCEPTO	TOTAL CONCEPTO
1	50005-01-09	OTROS SERVICIOS DE PROPIEDAD I	54 INFORMACION DETALLADA DE UN TRAMI
			TOTAL : \$ 26,000.00

SON: VEINTISEIS MIL PESOS

RESPONSABLE :

RECIBO DE CAJA APLICADO AL EXPEDIENTE No. _____

RESUMEN DE LA INVENCION

Se describen artículos impresos y métodos para fabricar artículos impresos. Los artículos impresos típicamente incluyen: (a) un sustrato que tiene una
5 superficie superior y una superficie inferior; (b) una capa de imagen gráfica que comprende una pluralidad de imágenes impresas por lo menos en una superficie del sustrato; y (c) una pluralidad de lentes poligonales impresas o formadas por lo menos en una superficie del sustrato sobre la capa de
10 imagen gráfica, donde las lentes poligonales son lentes convexas, de amplificación, claras. Las lentes pueden amplificar de manera selectiva porciones de la disposición imágenes para crear una pluralidad de imágenes que aparecen y desaparecen o imágenes que flotan bajo o en la parte superior
15 de la imagen gráfica cuando se ve desde diferentes perspectivas.

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**ARTÍCULO IMPRESO PARA DESPLEGAR IMÁGENES QUE TIENEN
DEFINICIÓN Y PROFUNDIDAD MEJORADA**

CAMPO DE LA INVENCION

5 La invención se refiere a artículos impresos que despliegan
imágenes, las cuales pueden incluir imágenes compuestas. Los
artículos impresos pueden incluir tarjetas de crédito
seguras, tarjetas comerciales, tarjetas de felicitación,
letreros, carteles, etiquetas, calcomanías, cubiertas de
10 libros, paneles decorativos, placas con nombres, exhibiciones
visuales y similares. Los artículos impresos pueden desplegar
o proyectar una imagen compuesta amplificada por una
pluralidad de lentes geométricas claras impresas o formadas
sobre un diseño gráfico estampado. La imagen compuesta puede
15 representar ilusiones visuales de profundidad,
tridimensionalidad, imágenes ocultas o de movimiento. La
imagen compuesta puede proporcionar el artículo impreso con
características identificables que no pueden copiarse
fácilmente (por ejemplo, imágenes holográficas, imágenes
20 ocultas, y similares).

ANTECEDENTES DE LA INVENCION

Para atraer la atención de los clientes, muchos
productos se fabrican con imágenes que proporcionan una

presentación visual única y sensacional. Para satisfacer esta demanda, se han desarrollado una variedad de técnicas de impresión para producir efectos visuales estéticamente atractivos, tales como la aparición de profundidad, tridimensionalidad y movimiento. Además, se conocen varios métodos en la técnica anterior que proporcionan imágenes ocultas o latentes o imágenes tridimensionales sobre medios bidimensionales. La imagen oculta o latente puede volverse aparente sólo al ver el medio bidimensional desde un ángulo.

Además, el uso de imágenes ocultas o latentes o imágenes tridimensionales pueden ser útiles para evitar la falsificación, donde las imágenes no pueden ser copiadas por métodos convencionales. La única manera de duplicar la apariencia y el efecto de imagen flotante u oculta es recrear el artículo impreso real, incluyendo la gráfica representada y las capas ópticas.

Un método para crear imágenes tridimensionales implica imprimir dos imágenes desplazadas en diferentes colores en una lámina opaca o transparente, y visualizar las imágenes utilizando gafas especiales que tienen lentes derecho e izquierdo que corresponden a con los diferentes colores de la imagen, respectivamente. Este método es limitado, ya que para ver el efecto visual el espectador debe observar la imagen típicamente a través de gafas especiales.

Otro método para lograr una presentación tridimensional o visual animada es a través del uso de sistemas de formación de imágenes lenticulares o de disposición de lentes. En estos sistemas, una disposición de lentes convexas paralelas se forma sobre un sustrato de plástico transparente, donde las lentes paralelas amplifican porciones de las imágenes impresas bajo las mismas. Al visualizar el sustrato desde diferentes ángulos, un espectador observa diferentes porciones enfocadas de las imágenes subyacentes, de modo que una imagen general o de diseño se ve en un ángulo de visualización y una imagen diferente es visible en otro ángulo de visualización. Esto puede resultar en un número de efectos visibles, tales como una imagen tridimensional, una imagen simple A a cambio de imagen B (o transversión), o múltiples imágenes que muestran una serie de imágenes desde un ángulo de visualización a otro que resulta en la apariencia de ver un fragmento de video en movimiento. A pesar de la variedad de efectos posibles, estos sistemas han tenido un éxito limitado debido a que los gastos de fabricación y los costos de material son muy elevados. Los sistemas de la técnica anterior también se limitan en que pueden utilizar una lámina prefabricada de lentes, en lugar de lentes que se imprimen directamente en una porción seleccionada de una imagen gráfica.

Las Patente Norteamericanas Nos. 6,856,462 y 6,833,960 describen sistemas de formación de imágenes lenticulares (después de esto denominadas como las patentes '462 y '960, respectivamente). Ambas patentes '462 y '960 describen la impresión o formación de una disposición de lentes que comprende una pluralidad de formas lineales o circulares cuando se ven desde una perspectiva plana superior. Sin embargo, los sistemas lenticulares descritos en las patentes '462 y '960 se limitan debido a que utilizan lentes en forma lineal o circular. La claridad de una imagen compuesta producida a partir de una disposición será proporcional a la cantidad de amplificación de material de la lente en la disposición contra el espacio no amplificado entre el material de la lente de amplificación. Por lo tanto, es deseable que las lentes dentro de una disposición se agrupen tan estrechamente como sea posible. La proximidad permitida de las lentes, sin embargo, se limitarán debido a "inundación", que puede presentarse después de que una disposición de lentes se imprime y antes de su curación. La "Inundación" ocurre cuando la tensión superficial de las lentes impresas no es suficiente para evitar que una lente se fusione con una o más lentes adyacentes antes de la curación. La "Inundación" destruye la uniformidad de una disposición. Por consiguiente, las lentes deben colocarse en una

disposición para incluir un espacio entre las lentes adyacentes para evitar inundación. La geometría y colocación de las lentes en los artículos descritos debe seleccionarse para maximizar el área porcentual de las lentes de
5 amplificación y maximizar las áreas sin amplificación dentro de una pluralidad de lentes en vista de este espacio entre las lentes.

Además, es deseable maximizar la altura (o espesor) de las lentes en una disposición para maximizar la
10 amplificación. La altura permitida de las lentes también se limitará debido a la "inundación", donde la tensión superficial del líquido utilizado para formar las lentes no permitirá lentes de altura excesiva, sin que se presente inundación. Por lo tanto, la geometría y colocación de las
15 lentes en los artículos descritos también debe seleccionarse para maximizar la altura permitida de las lentes.

Las lentes de forma lineal y circular no logran estas metas manifestadas. Las lentes lineales tienen uso limitado en sistemas lenticulares debido a que se enfocan
20 sólo en una dirección lineal y presentan dificultades adicionales con respecto a la obtención de altura deseable de la lente. Las lentes de forma circular son desventajosas, ya que su forma curva no permite la disposición de agrupación más estrecha posible con una disposición de lentes,

considerando además evitar "inundación".

La Patente Norteamericana No. 5,800,907 describe un cuerpo de lente, o artículo con lentes que se produce al formar "líneas que definen formación de lentes" en la superficie de un sustrato. Las "líneas que definen formación de lentes" se utilizan para crear una rejilla estampada en la superficie de un sustrato y una resina de formación de lente que entonces se aplica a la rejilla estampada. La resina de formación de lente es insoluble en el material utilizado para crear las "líneas que definen formación de lentes" y forma lentes dentro de los espacios de la rejilla estampada después de que la rejilla estampada se reviste con la resina de formación de lente. Como tal, la patente '907 no describe que las lentes puedan aplicarse o imprimirse directamente en una imagen (o imagen de micro-diseño) en una superficie del sustrato. Además, las "líneas que definir formación de lentes" de la patente '907 agregan complejidad y costo a los métodos de fabricación de los artículos descritos.

La presente invención logra estas metas y soluciona estas limitaciones en la técnica anterior al utilizar lentes poligonales transparentes que se aplican o imprimen en una imagen (o imagen de micro-diseño) en la superficie del sustrato. Artículos impresos y la formación de imágenes lenticulares que utilizan las lentes poligonales

transparentes despliegan imágenes que tienen una definición y profundidad mejoradas.

No existe ninguna referencia en la técnica anterior en la especificación, y no debe tomarse como conocimiento o
5 ninguna forma de sugerencia que esta técnica anterior forme parte general del conocimiento general común en alguna jurisdicción o que esta técnica anterior podría esperarse de manera razonable que se asegure, entienda y tome como relevante por una persona de experiencia ordinaria en la
10 técnica.

SUMARIO DE LA INVENCION

Se describen artículos que incluyen imágenes gráficas y lentes poligonales impresas para desplegar las
15 imágenes gráficas. Las lentes poligonales impresas son transparentes, lentes de amplificación que pueden proyectar una imagen compuesta formada a partir de las imágenes gráficas.

En algunas modalidades, los artículos descritos
20 incluyen artículos impresos y sistemas de formación de imágenes lenticulares. Los artículos pueden incluir: (a) un sustrato que tiene una superficie superior y una superficie inferior; (b) una capa de imagen gráfica que comprende una imagen impresa en por lo menos una superficie del sustrato; y

(c) una pluralidad de lentes poligonales formadas o impresas en por lo menos una superficie del sustrato por encima de la capa de imagen gráfica (por ejemplo, lentes poligonales, que son lentes transparentes, de amplificación, convexas). La

5 capa de imagen gráfica puede incluir una imagen gráfica y una imagen de micro-diseño separada, la cual puede comprender una pluralidad de imágenes repetidas en una disposición o matriz. El artículo puede incluir una capa transparente formada o impresa sobre la capa de imagen gráfica en la cual la

10 pluralidad de lentes poligonales se forma o imprime. En algunas modalidades, cada una de la pluralidad de lentes poligonales se forma individualmente o se imprime en la capa de imagen gráfica o la capa transparente.

La pluralidad de lentes poligonales impresa puede

15 organizarse como una disposición o matriz que corresponde con la pluralidad de imágenes repetidas de la imagen de micro-diseño. La pluralidad de lentes poligonales impresa puede crear una imagen compuesta formada por porciones de amplificación de la pluralidad de imágenes repetidas. En

20 algunas modalidades, la disposición o matriz de imágenes típicamente incluye filas paralelas de imágenes repetidas en la disposición o matriz de lentes poligonales típicamente incluye filas paralelas de lentes, donde la frecuencia de las imágenes repetidas es diferente de la frecuencia de las

lentes.

En modalidades preferidas, las lentes poligonales se seleccionan de lentes hexagonales y lentes tetragonales (por ejemplo, lentes cuadradas, lentes rectangulares, lentes romboides o lentes en forma de diamante). De mayor preferencia, las lentes poligonales incluyen lentes hexagonales. En algunas modalidades, las lentes se imprimen directamente en la capa de imagen gráfica. En otras modalidades, se presenta una capa transparente por encima de la capa de imagen gráfica y las lentes se imprimen directamente en la capa transparente.

En algunas modalidades, las lentes impresas pueden ser semicirculares en sección transversal o en forma de media luna en sección transversal. En otras modalidades, las lentes impresas pueden ser sustancialmente planas en sección transversal. Por ejemplo, las lentes pueden tener una cara superior que sustancialmente es paralela a una superficie del sustrato por al menos 50% del área superficial de la cara superior.

Los artículos descritos típicamente incluyen una capa de imagen gráfica. La capa de imagen gráfica puede imprimirse en la superficie superior, superficie inferior, o ambas superficies del sustrato. En algunas modalidades, la capa de imagen gráfica comprende una disposición o matriz de

imágenes que puede incluir una imagen de micro-diseño. La disposición o matriz puede incluir una disposición ordenada de una imagen gráfica repetida en uno o más planos. Las imágenes de la disposición pueden separarse de manera
5 uniforme en uno o más planos (por ejemplo, horizontal y/o verticalmente).

Los artículos descritos típicamente incluyen una pluralidad de lentes poligonales impresas que pueden organizarse como una disposición o matriz y pueden incluir un
10 micro-patrón de lentes. Las lentes de una disposición pueden separarse de manera uniforme en uno o más planos (por ejemplo, horizontal y/o vertical). En algunas modalidades, una disposición de lentes poligonales puede orientarse sobre una disposición de imágenes de modo que cada lente amplifica
15 una porción de una imagen para desplegar por lo menos una imagen compuesta que se forma a partir de cada porción amplificada de la imagen. En algunas modalidades, la imagen compuesta se despliega encima de la superficie superior del sustrato. En otras modalidades, la imagen compuesta se
20 despliega bajo la superficie superior del sustrato. En modalidades adicionales, los artículos descritos pueden desplegar diferentes imágenes cuando los artículos se ven desde diferentes ángulos. Las diferentes imágenes pueden incluir imágenes de color diferente. La disposición de lentes

puede tener una frecuencia (es decir, lentes por distancia vertical y/u horizontal) que es la misma o diferente que una frecuencia para una disposición de imágenes (es decir, imagen por distancia vertical y/u horizontal).

5 En algunas modalidades, los artículos descritos incluyen una disposición de lentes impresas como una disposición ordenada, cuando se presenta una lente en una frecuencia seleccionada en la disposición. Por ejemplo, la disposición de lentes impresas puede incluir un número de
10 lentes separadas de manera uniforme por una distancia lineal en uno o más planos (por ejemplo, 100 lentes por pulgada lineal, horizontal y/o verticalmente). Además, los artículos descritos pueden incluir una disposición de imágenes, como una disposición ordenada de imágenes que se presentan en una
15 frecuencia seleccionada. Por ejemplo, la disposición de imágenes puede incluir un número de imágenes separadas de manera uniforme por la distancia lineal en uno o más planos (por ejemplo, aproximadamente 100 imágenes por pulgada lineal, horizontal y/o verticalmente proporcionando un
20 "micro-patrón" de imágenes). En algunas modalidades, la frecuencia de lentes impresas difiere de la frecuencia de imágenes. Por ejemplo, la frecuencia de lentes impresas puede ser menor o mayor que la frecuencia de imágenes. En otras modalidades, la frecuencia de lentes impresas es la misma que

la frecuencia de imágenes (las cuales de preferencia pueden ser donde imágenes con colores diferentes se despliegan por el artículo cuando se ven desde diferentes ángulos).

Las lentes impresas de la disposición pueden
5 configurarse para tener ancho y altura seleccionados. En algunas modalidades, las lentes son hexagonales y tienen un ancho (W) promedio de lado a lado como se observa en una vista en planta superior de 0.0005 a 0.0100 pulgadas (es decir, 12.7 a 254 micrones), y una altura (H) promedio (es
10 decir, espesor de centro máximo o "en hundimiento") de aproximadamente 0.0001 a 0.0050 pulgadas (es decir, 2.54 a 127 micrones). En modalidades adicionales, la relación de altura (H) promedio con el ancho (W) promedio es de por lo menos aproximadamente 0.1 (de preferencia por lo menos
15 aproximadamente 0.2, 0.3, 0.4, 0.5, 0.6, 0.7, 0.8, 0.9 ó 1.0).

Las lentes impresas de una disposición pueden configurarse para tener un espacio seleccionado dentro de la disposición. En algunas modalidades, las lentes impresas
20 tienen un espacio (S) promedio en la disposición de aproximadamente 0.0005 a 0.0100 pulgadas (es decir, 2.54 a 254 micrones). En modalidades adicionales, las lentes (o por lo menos porciones de las lentes) comprenden por lo menos aproximadamente 50% de la superficie de la disposición y no

más del 50% de la superficie de la disposición es "espacio muerto" (es decir, espacio no ocupado por una lente o por lo menos una porción de una lente). En modalidades adicionales, las lentes comprenden por lo menos aproximadamente 60%, 70%, 5 80% o 90% de la superficie de la disposición y no más de aproximadamente 40%, 30%, 20% o 10% de la superficie de la disposición es espacio muerto. En modalidades adicionales, la relación de espacio (S) promedio de las lentes dentro de la disposición con el ancho (W) promedio de las lentes dentro de 10 la disposición no es mayor a aproximadamente 1.0 (de preferencia no mayor a aproximadamente 0.9, 0.8, 0.7, 0.6, 0.5, 0.4, 0.3, 0.2 ó 0.1).

Las lentes impresas típicamente son convexas y enfocan rayos paralelos de luz hacia un punto focal principal 15 donde la distancia desde la lente hasta el punto focal es la longitud focal (f) de la lente. En algunas modalidades, las lentes impresas tienen una longitud focal (f) promedio de aproximadamente 0.0010 a 0.0500 pulgadas (es decir, 25.4 a 1270 micrones). En modalidades adicionales, la relación de la 20 altura (H) de la lente promedio con la longitud focal (f) promedio es de por lo menos aproximadamente 0.1 (de preferencia por lo menos aproximadamente 0.2, 0.3, 0.4 ó 0.5).

Las lentes pueden imprimirse en un sustrato que

tiene un ancho promedio que se aproxima a la longitud focal de la lente (f). En algunas modalidades, el sustrato puede tener un ancho promedio de aproximadamente 0.0010-0.0500 pulgadas (es decir, 25.4 a 1270 micrones).

5 Los artículos pueden incluir componentes adicionales. Por ejemplo, los artículos además pueden incluir una capa transparente formada por lo menos sobre una superficie del sustrato (por ejemplo, sobre una superficie por encima de la capa de imagen gráfica).

10 Los artículos descritos pueden incluir una segunda capa de imagen gráfica por lo menos en una superficie del sustrato. Por ejemplo, la segunda capa de imagen gráfica puede comprender una segunda imagen gráfica (por ejemplo, una macro-imagen) o segunda disposición de imágenes (por ejemplo,
15 una segunda imagen de micro-diseño), además de la primera disposición de imágenes presentes en la primera capa de imagen gráfica. La disposición de lentes puede o no formarse sobre la segunda capa de imagen gráfica. La disposición de lentes puede tener una frecuencia que es menor que, lo mismo
20 que o mayor que una frecuencia para una segunda disposición de imágenes presentes en una segunda capa de imagen gráfica.

El sustrato de los artículos descrito puede ser opaco, translucido, semitransparente o totalmente transparente. Opcionalmente, el sustrato incluye una capa

clara o completamente transparente formada sobre una capa de imagen gráfica.

También se describen sistemas de formación de imágenes lenticulares. El sistema puede incluir: (a) un sustrato que tiene una superficie superior y una superficie inferior; (b) una capa de imagen gráfica que comprende una pluralidad de imágenes que se forman en por lo menos una superficie del sustrato, y (c) una pluralidad de lentes poligonales formados en por lo menos una superficie del sustrato sobre la capa de imagen gráfica, en donde las lentes poligonales son lentes convexas, de amplificación, transparentes, que se orientan por encima de la pluralidad de imágenes de modo que cada lente amplifica una porción de una imagen para desplegar por lo menos una imagen compuesta. Pluralidades de imágenes pueden incluir disposiciones o matrices de imágenes. Pluralidades de lentes pueden incluir disposiciones o matrices de lentes. Las imágenes y lentes pueden formarse utilizando métodos que pueden incluir impresión, repujado, grabado, y estampado.

También se describen métodos para formar los artículos descritos. En algunas modalidades, los métodos para formar los artículos descritos comprenden: (a) imprimir una capa de imagen gráfica que comprende una disposición o matriz de imágenes por lo menos en una superficie de un sustrato,

opcionalmente, formar una capa clara o totalmente transparente sobre la capa de imagen gráfica, y (b) formar o imprimir una disposición o matriz de lentes poligonales sobre por lo menos una superficie del sustrato por encima de la

5 capa de imagen gráfica, en donde las lentes poligonales son lentes convexas, de amplificación, transparentes. El artículo puede incluir lentes poligonales seleccionadas del grupo que consistente de lentes hexagonales, lentes en forma cuadrada, lentes en forma rectangular, y lentes en forma de rombo (de

10 preferencia lentes hexagonales). Las lentes poligonales pueden ser semi-circulares, en forma de media luna, o sustancialmente planas en sección transversal. Típicamente, los métodos producen un artículo donde la disposición o matriz de lentes poligonales se orientan por encima de la

15 disposición o matriz de imágenes de modo que cada lente amplifica una porción de la imagen para desplegar por lo menos una imagen compuesta como se describe en la presente.

Los métodos para formar los artículos descritos de preferencia incluyen etapas de lentes en las cuales se evita

20 la inundación de lentes impresas, sangrado de las lentes impresas, el flujo no uniforme o indeseable de las lentes, errores digitales, errores mecánicos, y opcionalmente espacio muertos dentro de una disposición. En algunas modalidades de las disposiciones, las lentes impresas se orientan en filas

paralelas, donde las lentes impresas de una fila, se desplazan en un ángulo (θ_1) con respecto a las lentes impresas de una fila adyacente. La orientación o ángulo θ_1 de filas paralelas de lentes impresas puede ajustarse o seleccionarse con respecto a la dirección de errores observados en el proceso de impresión para minimizar y compensar estos errores como se discute además en la presente. Ejemplos de tales errores incluyen errores relacionados con la dirección de la impresión, de corte, del movimiento del rodillo de goma, y errores de anilox o impresión por grabado, errores de salida de película; y errores de procesamiento de imagen en cuadrícula digital.

BREVE DESCRIPCIÓN DE LAS FIGURAS

La FIGURA 1 es una vista en corte transversal agrandada de una modalidad de un artículo impreso producido de acuerdo con la presente invención;

La FIGURA 2 es una vista de 30 grados desde una perspectiva lateral izquierda de una vista en planta superior de una tarjeta de crédito segura producida de acuerdo con la presente invención.

La FIGURA 3 es una imagen de 30 grados desde una perspectiva lateral derecha de una vista en planta superior de una tarjeta de crédito segura producida de acuerdo con la

presente invención.

La FIGURA 4 es una vista en planta superior altamente amplificada de una imagen de micro-diseño producida de acuerdo con la presente invención.

5 La FIGURA 5 es una vista en planta superior altamente amplificada de las lentes hexagonales transparentes producidas de acuerdo con la presente invención.

La FIGURA 6 es una vista en corte transversal de un artículo impreso de acuerdo con otra modalidad de la presente
10 invención que tiene una capa transparente depositada sobre una imagen de micro-diseño y bajo lentes transparentes.

La FIGURA 7 es una vista en corte transversal de un artículo impreso de acuerdo con otra modalidad de la presente invención, donde la imagen de micro-diseño se imprime sobre
15 la superficie de un sustrato transparente y se imprimen lentes transparentes en la superficie opuesta del sustrato transparente.

La FIGURA 8 es una vista en planta superior de un artículo impreso de acuerdo con una modalidad de la presente
20 invención, que muestra la apariencia de una imagen oculta cuando se ve desde un ángulo.

La FIGURA 9 es una vista en planta superior del artículo de la FIGURA 8 que tiene una imagen oculta cuando se ve desde un ángulo superior.

La FIGURA 10 es una vista en corte transversal de otra modalidad de la presente invención, que muestra la apariencia de una lente transparente sustancialmente plana.

La FIGURA 11 es una vista en corte transversal de otra modalidad de la presente invención, que muestra lentes transparentes impresas sobre la superficie superior de un sustrato transparente, e imágenes de micro-diseño impresas sobre la superficie inferior del sustrato transparente.

10

DESCRIPCIÓN DETALLADA DE LA INVENCION

La materia objeto descrita en la presente se describe utilizando varias definiciones, como se establece en lo siguiente y a través de la solicitud.

A menos que se especifique lo contrario o se indique por el contexto, los términos "uno" "una", y "el" significa "uno o más".

Como se utiliza en la presente, "alrededor" "aproximadamente" "sustancialmente" y "significativamente" se entenderá por personas de experiencia ordinaria en la técnica y variará al mismo grado en el contexto en el cual se utilizan. Si existen usos del término, que no son claros para las personas de experiencia ordinaria en la técnica, dado el contexto en el cual se utiliza, "alrededor" y "aproximadamente" significaran más o menos $\leq 10\%$ del término

particular y "sustancialmente" y "significativamente" significará más o menos >10% del término en particular.

Como se utiliza en la presente, los términos "incluye" y "que incluye" tienen el mismo significado que los
5 términos "comprende" y "que comprende".

Como se utiliza en la presente, un "polígono" es una figura plana enlazada por tres o más segmentos de línea recta o "lados", donde los lados se unen en tres o más esquinas y el número de esquinas corresponde con el número de
10 lados. Como tal, una forma "poligonal" es una forma plana cerrada de varios lados. Los polígonos pueden incluir triángulos (o triángulos), tetrágonos (o cuadriláteros), pentágonos, hexágonos, heptágonos, octógonos, y similares. Los tetrágonos pueden incluir cuadrados y rectángulos, los
15 cuales tienen cuatro lados conectados en cuatro ángulos rectos. Los tetrágonos también puede incluir rombos (por ejemplo, polígonos en forma de diamante o paralelogramos), los cuales no incluyen cuatro ángulos rectos. Como se utiliza en la presente, un "polígono" no incluye una forma circular
20 (es decir, un punto) o una forma circular agrandada, tal como una forma ovalada o una forma tubular. En la sección transversal, las lentes descritas en la presente pueden ser semicirculares, en forma de media luna, o sustancialmente planas. (Véase la FIGURA 10). Una lente que es

"sustancialmente plana" en sección transversal puede tener una cara superior, donde por lo menos 50% de la superficie de la cara superior es aproximadamente paralela a la superficie del sustrato. La lente puede incluir una curvatura en la superficie restante de la cara superior desde la porción aproximadamente plana hasta el punto donde la cara superior contacta la superficie del sustrato (es decir, curvatura a lo largo de la periferia de la lente). La superficie sustancialmente plana de las lentes evita la amplificación de la imagen impresa, cuando se ve desde una perspectiva plana superior. La curvatura a lo largo de la periferia de la lente crea una amplificación de una imagen de diseño subyacente sólo cuando la imagen de diseño se ve desde una perspectiva sustancial no plana. De este modo, cuando el artículo impreso se ve desde la perspectiva plana superior, ninguna imagen compuesta se ve y cuando el ángulo de visualización se cambia a una vista sustancial no plana, una imagen oculta que comprende porciones amplificadas de la imagen impresa se revelan.

Los artículos descritos típicamente incluyen una pluralidad de imágenes, las cuales pueden organizarse como una disposición o matriz de imágenes y puede ser una imagen de micro-diseño. En algunas modalidades, las imágenes pueden disponerse en líneas paralelas desplazadas. (Véase, por

ejemplo, FIGURA 4, que muestra una disposición de imágenes en forma de globos dispuestas en líneas paralelas que se desplazan horizontales por 50%). Los artículos descritos típicamente también incluyen una pluralidad de lentes
5 *poligonales, que pueden organizarse como una disposición o matriz de lentes y pueden disponerse en líneas paralelas desplazadas. (Véase, por ejemplo, FIGURA 5, que muestra una disposición de lentes hexagonales dispuestas en líneas paralelas que se desplazan horizontalmente por 50%).*

10 La frecuencia de las lentes en una disposición pueden ser menor, la misma que o mayor que la frecuencia de imágenes en una disposición. En algunas modalidades, las lentes pueden desplegar una imagen compuesta por encima o por debajo de la superficie de la capa de imagen gráfica. En
15 modalidades adicionales, las lentes pueden desplegar diferentes imágenes cuando el artículo se ve desde diferentes ángulos o imágenes de un color diferente cuando el artículo se ve desde diferentes ángulos.

 En algunas modalidades de los artículos descritos,
20 cada lente impresa en una disposición puede amplificar una porción de una imagen dentro de una disposición de imágenes de modo que una imagen compuesta se forma a partir de las porciones amplificadas. La imagen amplificada puede aparecer como una imagen tridimensional que flota sobre o por debajo

de la superficie del sustrato. Para amplificar porciones de la imagen dentro de la disposición de imágenes, típicamente la disposición de lentes impresas tienen una frecuencia que es diferente de la frecuencia de las imágenes dentro de la

5 disposición de imágenes. Como se utiliza en la presente, "frecuencia" puede referirse al número de imágenes que se presentan dentro de una longitud lineal de la disposición de imágenes. Similarmente, "frecuencia" puede referirse al número de lentes impresas que se presentan dentro de una

10 longitud lineal de la disposición de lentes. Por ejemplo, una disposición de imágenes puede incluir aproximadamente 100 imágenes por pulgada lineal (horizontal, vertical o en ambas direcciones). Similarmente, una disposición de lentes puede incluir aproximadamente 100 lentes por pulgada lineal

15 (horizontal, vertical o en ambas direcciones). Sin embargo, para crear una imagen compuesta, típicamente la frecuencia para la disposición de imágenes diferirá de la frecuencia de la disposición de lentes. Esto resulta en que cada lente de la disposición se "desplaza" con respecto a cada imagen de la

20 disposición. Donde la frecuencia de imágenes es menor que la frecuencia de lentes (por ejemplo, 99 por pulgada contra 100 por pulgada respectivamente), la imagen compuesta se invertirá y parecerá que flota sobre la superficie del sustrato. Donde la frecuencia de imágenes es mayor que la

frecuencia de lentes (por ejemplo, 100 por pulgada contra 99 por pulgada, respectivamente), la imagen parecerá que flota detrás de la superficie del sustrato. En algunas modalidades, frecuencias adecuadas para las disposiciones de imágenes y lentes pueden incluir 96, 97, 98, 99, 100, 101, 102, 103 ó 104 imágenes o lentes por pulgada, donde la frecuencia para la disposición de imágenes y la frecuencia para la disposición de lentes pueden ser la misma o diferente.

Las imágenes gráficas y la lente pueden aplicarse a un sustrato mediante cualquier método adecuado. Por ejemplo, en algunas modalidades las imágenes gráficas y la lente pueden aplicarse utilizando métodos que incluyen impresión, repujado, grabado, estampado, o una combinación de los mismos. Las imágenes gráficas pueden aplicarse utilizando un método seleccionado (por ejemplo, impresión) y la lente puede aplicarse utilizando el mismo método o diferente (por ejemplo, repujado). Los métodos de impresión pueden incluir litografía, flexografía, serigrafía, y similares.

Los artículos descritos pueden incluir componentes adicionales, los cuales, por ejemplo, pueden imprimirse, repujarse, grabarse, o estamparse en los artículos. En algunas modalidades, los artículos descritos pueden incluir un artículo impreso que comprende un sustrato que tiene una superficie superior impresa con una imagen de micro-diseño y,

opcionalmente, incluir una imagen gráfica adicional. La imagen gráfica adicional puede incluir un segundo patrón de imágenes (por ejemplo, una segunda imagen de micro-diseño) o puede incluir una o más imágenes de no diseño (por ejemplo, una macro-imagen). Opcionalmente, una capa clara o totalmente transparente puede formarse o imprimirse sobre la imagen de micro-diseño impresa (y sobre la imagen gráfica adicional del segundo patrón de imágenes, donde se presenten). Sobre estas imágenes se forma o imprime una pluralidad de lentes poligonales transparentes donde la pluralidad de lentes poligonales transparentes se coloca sobre la o las imágenes de micro-diseños y, opcionalmente, la imagen gráfica adicional. La frecuencia de imágenes en la o las imágenes de micro-diseños y la frecuencia de lentes poligonales transparentes en la pluralidad de lentes puede seleccionarse de modo que cada lente transparente individual amplifica una porción de una imagen en la primera imagen de micro-diseño y, opcionalmente, la segunda imagen de micro-diseño, donde la imagen gráfica adicional incluye una segunda imagen de micro-diseño. Cuando se ve desde una vista en planta superior, la pluralidad de lentes transparentes puede desplegar una imagen compuesta formada de las porciones amplificadas de la primera imagen de micro-diseño, y, opcionalmente, la segunda imagen de micro-diseño. La imagen compuesta o imágenes pueden ser

diferentes y pueden parecer que flotan sobre o debajo de la superficie del sustrato. En algunas modalidades, la imagen gráfica adicional puede comprender una segunda imagen de micro-diseño que tiene una frecuencia que difiere de la frecuencia de la primera imagen de micro-diseño. En modalidades adicionales, las lentes pueden desplegar múltiples imágenes diferentes cuando el artículo se ve desde diferentes ángulos. Las múltiples imágenes diferentes, pueden incluir imágenes de colores diferentes y/o imágenes de formas diferentes.

La presente invención soluciona las limitaciones de la técnica anterior, por la utilización de lentes poligonales transparentes. Las lentes poligonales descritas pueden utilizarse para maximizar la densidad para el material de amplificación en una disposición de lentes. Además, la impresión por lo tanto, de lentes transparentes más gruesas de líneas paralelas ahora puede compensarse al eliminar los ángulos de filas paralelas de lentes que corren en perpendicular a la dirección de impresión del dispositivo de salida, y/o al ajustar de manera digital el espesor y espacio de las filas paralelas de lentes que se producirá en direcciones perpendiculares al dispositivo de impresión de salida. Seleccionar ángulos para la pluralidad de lentes poligonales transparentes para evitar inundación o flujo

conjunto de las lentes transparentes puede asegurar que el artículo impreso tenga una imagen nítida y clara. Al controlar los ángulos de la pluralidad de lentes poligonales transparentes, la altura y/o espesor de las lentes puede
5 incrementarse sin que se presente inundación. Además, para la misma altura y espesor comparativo de la lente, la distancia entre las lentes también puede disminuirse mientras se minimiza el riesgo de que la tinta de lentes adyacentes se derrame o manche entre sí. Esto incrementa la ilusión visual
10 de la tridimensionalidad al incrementar la concentración en un área dada de lentes de amplificación contra el espacio no amplificado entre las lentes poligonales transparentes.

Además, ciertas formas geométricas se han descubierto que pueden imprimirse más cerca sin inundación.
15 Las líneas y puntos sólo pueden imprimirse lo suficientemente separadas de modo que la tensión superficial y las fuerzas de corte mecánica de los procesos de impresión no provoquen inundación conjunta de las lentes transparentes. Típicamente, la impresión de puntos circulares de tinta transparente
20 requiere de treinta a cuarenta por ciento de espacio de área de lente "sin puntos" entre las lentes para evitar que los puntos se inunden cuando se impriman. Esto resulta en treinta a cuarenta por ciento de áreas sin amplificación en el artículo impreso. Crear e imprimir las lentes en ciertas

formas geométricas, tales como hexágonos, permite el mismo espaciado que lentes de puntos circulares mientras resiste las fuerzas de tensión superficial atractivas que pueden provocar que las lentes de puntos circulares se inunden.

5 Además, la impresión de lentes hexagonales reduce efectivamente el área sin amplificación de treinta a cuarenta por ciento hasta quince a veinte por ciento sin áreas de amplificación, donde las lentes hexagonales pueden colocarse con menos espacios "sin lente" que las lentes de puntos
10 circular. Esto resulta en efectos tridimensionales más claros cuando se amplifica una imagen de micro-diseño subyacente por una disposición correspondiente de lentes hexagonales.

También se ha observado que los ángulos de filas de lentes transparentes, y las formas geométricas de las lentes
15 mismas son susceptibles a errores impartidos de la dirección relativa de la impresión, del corte, del movimiento del rodillo de goma, de la impresión de rollos de anilox o grabado, errores de salida de película; errores de procesamiento de imágenes de cuadrícula digital, y error que
20 resulta de las fuerzas de tensión superficial. Formas geométricas específicas y ángulos para las filas paralelas de lentes transparentes pueden seleccionarse basándose en la minimización y compensación de estos errores para lograr por lo tanto una altura de lente inalcanzable y agrupar más las

lentes transparentes, evitando el sangrado, inundación, y flujo de la tinta de textura transparente.

MODALIDADES ILUSTRATIVAS

5 Las siguientes modalidades son ilustrativas y no se pretenden para limitar el alcance de la materia objeto reclamada.

Modalidad 1. Un artículo impreso que comprende: (a) un sustrato que tiene una superficie superior; (b) una imagen
10 gráfica formada sobre la superficie superior del sustrato; (c) una imagen de micro-diseño formada sobre la superficie superior del sustrato; y (d) una pluralidad de lentes geométricas claras formada sobre la superficie de imagen
15 gráfica, en donde la pluralidad de lentes geométricas claras se coloca sobre la imagen gráfica y la imagen de micro-diseño, en donde las lentes geométricas claras son semicirculares en sección transversal y en una vista en planta superior se comprenden de hexágonos, círculos, diamantes, cuadrados o rectángulos, y la pluralidad de lentes
20 geométricas claras se orientan por encima de la imagen de micro-diseño, de modo que cada lente geométrica transparente individual amplifica una porción de la imagen de micro-diseño de modo que pluralidad de lentes geométricas transparentes amplifican y combinar múltiples porciones de micro-diseño

para desplegar una imagen compuesta, la cual cuando se ve desde diferentes direcciones se despliega en diferentes porciones del artículo impreso.

Modalidad 2. Un artículo impreso que comprende: (a)
5 un sustrato que tiene una superficie superior; (b) una imagen gráfica formada sobre la superficie superior del sustrato; (c) una imagen de micro-diseño formada sobre la superficie superior del sustrato; (d) una capa transparente formada sobre la superficie superior de la imagen de diseño; y (e)
10 una pluralidad de lentes geométricas claras formadas sobre la superficie de imagen gráfica, donde la pluralidad de lentes geométricas claras se colocan encima de la imagen gráfica y la imagen de micro-diseño, en donde las lentes geométricas claras son semicirculares y en sección transversal y en una
15 vista en planta superior se compone de hexágonos, círculos, diamantes, cuadrados o rectángulos, y la pluralidad de lentes geométricas claras se orientan por encima de la imagen de micro-diseño de modo que cada lente geométrica clara individual amplifica una porción de la imagen de micro-diseño
20 de modo que la pluralidad de lentes geométricas claras combinan múltiples porciones del micro-diseño para desplegar una imagen compuesta que, cuando se ve desde diferentes direcciones se despliega en diferentes porciones del artículo impreso.

Modalidad 3. Un artículo impreso que comprende: (a) un sustrato transparente que tiene una superficie posterior y frontal, (b) una imagen de micro-diseño formada primero sobre la superficie posterior del sustrato, y (c) una pluralidad de lentes geométricas claras impresas sobre la superficie de la imagen gráfica, en donde la pluralidad de lentes geométricas claras se coloca sobre la imagen gráfica y la imagen de micro-diseño, donde las lentes geométricas claras son semicirculares en sección transversal y una vista en planta superior se comprende de hexágonos, círculos, diamantes, cuadrados o rectángulos y la pluralidad de lentes geométricas claras se orientan por encima de la imagen de micro-diseño de modo que cada lente geométrica clara individual amplifica una porción de la imagen de micro-diseño de modo que la pluralidad de lentes geométricas claras combinan múltiples porciones del micro-diseño para desplegar una imagen compuesta que cuando se ve desde diferentes direcciones se despliegan diferentes porciones del artículo impreso.

Modalidad 4. Un artículo impreso como en las modalidades 1-3, donde las lentes geométricas claras, cuando se ven en sección transversal, son sustancialmente planas para la mayor parte de la superficie de la lente geométrica clara y sustancialmente curvadas al rededor de la circunferencia de la forma geométrica, de modo que la imagen

del micro-diseño impresa bajo las lentes geometrías claras no se amplifica cuando se ve desde una perspectiva plana superior, aún cuando se ve desde ángulos sustancialmente no en una perspectiva plana superior, la curvatura
5 circunferencial de las lentes geométricas claras y amplifica la imagen de micro-diseño para revelar una imagen oculta.

Modalidad 5. Un método para formar un artículo impreso, el método incluye las etapas de (a) proporcionar un sustrato que tiene una superficie superior; (b) formar una
10 imagen gráfica sobre la superficie superior del sustrato; (c) formar una imagen de micro-diseño sobre la superficie superior del sustrato; (d) formar un diseño texturizado de una pluralidad de lentes geométricas claras formadas sobre la superficie de la imagen gráfica; y (e) formar las lentes
15 geométricas claras para ser semicirculares en sección transversal y se comprenden de hexágonos, círculos, diamantes, cuadrados o rectángulos también se ven desde una vista en planta superior; (f) colocar la pluralidad de lentes geométricas claras por encima de la imagen gráfica y la
20 imagen de micro-diseño; y (g) orientar la pluralidad de lentes geométricas claras sobre la imagen de micro-diseño de modo que cada lente geométrica clara individual amplifica una porción de la imagen de micro-diseño de modo que la pluralidad de lentes geométricas claras combinan múltiples

porciones del micro-diseño para desplegar una imagen compuesta que cuando se ve desde diferentes direcciones, la imagen compuesta se describe en diferentes porciones del artículo impreso.

5 Modalidad 6. Un método para formar un artículo impreso, el método incluye las etapas de (a) proporcionar un sustrato que tiene una superficie superior; (b) formar una imagen gráfica sobre la superficie superior del sustrato; (c) formar una imagen de micro-diseño sobre la superficie superior del sustrato; (d) aplicar una capa transparente sobre la superficie superior de la imagen de diseño; (e) formar un diseño texturizado de una pluralidad de lentes geométricas claras formadas sobre la superficie de la imagen gráfica; (f), formar las lentes geométricas claras para ser
10 semicirculares en sección transversal y se comprenden de hexágonos, círculos, diamantes, cuadrados o rectángulos cuando se ven desde una vista en planta superior; (g) colocar la pluralidad de lentes geométricas claras por encima de la imagen gráfica y la imagen micro-diseño; y (h) orientar la
15 pluralidad de lentes geométricas claras por encima de la imagen de micro-diseño de modo que cada lente geométrica clara individual amplifica una porción del micro-diseño de modo que la pluralidad de lentes geométricas claras combinan
20 múltiples porciones del micro-diseño para desplegar una

imagen compuesta cuando se ve desde diferentes direcciones, la imagen compuesta se despliega en diferentes porciones del artículo impreso.

Modalidad 7. Un método para formar un artículo
5 impreso, el método incluye las etapas de (a) proporcionar un sustrato transparente que tiene una superficie posterior y frontal; (b) formar una imagen gráfica sobre la superficie posterior del sustrato transparente; (c) formar una imagen de micro-diseño sobre la superficie posterior del sustrato; y
10 (d) formar un diseño texturizado de una pluralidad de lentes geométricas claras impresas sobre la superficie frontal del sustrato transparente; (e) formar las lentes geométricas claras para ser semicirculares en sección transversal y se comprenden de hexágonos, círculos, diamantes, cuadrados o
15 rectángulos cuando se ven desde una vista en planta superior; (f) colocar la pluralidad de lentes geométricas claras por encima de la imagen gráfica y la imagen de micro-diseño; y (g) orientar la pluralidad de lentes geométricas claras por encima de la imagen de micro-diseño de modo que cada lente
20 geométrica clara individual amplifica una porción del micro-diseño de modo que la pluralidad de lentes geométricas claras combinan múltiples porciones del micro-diseño para desplegar una imagen compuesta que cuando se ve desde diferentes direcciones, la imagen compuesta se despliega en diferentes

porciones del artículo impreso.

Modalidad 8. Un método para formar un artículo impreso como en cualquiera de modalidades 4-7, donde las lentes geométricas claras se forman para ser sustancialmente planas para la mayor parte de la superficie de la lente geométrica clara y sustancialmente curvada al rededor de la circunferencia de la forma geométrica cuando se ve en sección transversal, y los métodos además comprenden formar una imagen de micro-diseño bajo las lentes geométricas claras que no se amplifican cuando se ven desde una perspectiva plana superior; y formar una curvatura circunferencial de las lentes geométricas claras para amplificar la imagen de micro-diseño para revelar una imagen oculta cuando se ve desde los ángulos no sustancialmente desde una perspectiva plana superior.

Modalidad 9. Un artículo impreso que comprende: (a) un sustrato que tiene una superficie superior y una superficie inferior; (b) una capa de imagen gráfica que comprende una pluralidad de imágenes impresas por lo menos en una superficie de sustrato; y (c) una pluralidad de lentes poligonales impresos sobre por lo menos una superficie del sustrato por encima de la capa de imagen gráfica, en donde las lentes poligonales son lentes convexas, de amplificación, claras.

Modalidad 10. El artículo impreso de la modalidad 9, en donde la pluralidad de lentes poligonales comprende lentes poligonales seleccionadas del grupo que consisten de lentes hexagonales, lentes cuadradas, lentes rectangulares, y
5 lentes romboides.

Modalidad 11. El artículo impreso de la modalidad 10, en donde las lentes poligonales comprenden lentes hexagonales.

Modalidad 12. El artículo impreso de cualquiera de
10 las modalidades 9-11, en donde las lentes poligonales son semicirculares en sección transversal.

Modalidad 13. El artículo impreso de cualquiera de las modalidades 9-12, en donde las lentes poligonales son sustancialmente planas en sección transversal.

15 Modalidad 14. El artículo impreso de cualquiera de las modalidades 9-13, en donde la pluralidad de imágenes comprende una imagen de micro-diseño.

Modalidad 15. El artículo impreso de cualquiera de las modalidades 9-14, en donde la pluralidad de lentes
20 poligonales se orienta por encima de la pluralidad de imágenes de modo que cada lente amplifica una porción de una imagen para desplegar por lo menos una imagen compuesta.

Modalidad 16. El artículo impreso de cualquiera de las modalidades 9-15, en donde la pluralidad de lentes se

imprime individualmente en el sustrato.

Modalidad 17. El artículo impreso de cualquiera de las modalidades 9-16, en donde la pluralidad de imágenes comprende una disposición de imágenes y la pluralidad de lentes comprende una disposición de lentes.

Modalidad 18. El artículo impreso de la modalidad 17, en donde: la disposición de lentes tiene una frecuencia de lentes; la disposición de imágenes tiene una frecuencia de imágenes; y la frecuencia de lentes es mayor que la frecuencia de las imágenes.

Modalidad 19. El artículo impreso de la modalidad 17, en donde: la disposición de lentes tiene una frecuencia de lentes; la disposición de imágenes tiene una frecuencia de imágenes; y la frecuencia de lentes es menor que la frecuencia de las imágenes.

Modalidad 20. El artículo impreso de la modalidad 17, en donde: la disposición de lentes tiene una frecuencia de lentes; la disposición de imágenes tiene una frecuencia de imágenes; y la frecuencia de lentes es la misma que la frecuencia de imágenes.

Modalidad 21. El artículo impreso de la modalidad 17, en donde la disposición de imágenes comprende una imagen de micro-diseño.

Modalidad 22. El artículo impreso de cualquiera de

las modalidades 9-21, además comprende: (d) una segunda capa de imagen gráfica impresa por lo menos en una superficie del sustrato.

Modalidad 23. El artículo impreso de cualquiera de
5 las modalidades 9-22, en donde el sustrato es transparente.

Modalidad 24. El artículo impreso de la modalidad 23, en donde la capa de imagen gráfica se imprime sobre la superficie inferior del sustrato.

Modalidad 25. Un artículo impreso que comprende:
10 (a) un sustrato que tiene una superficie superior y una superficie inferior; (b) una capa de imagen gráfica que comprende una pluralidad de imágenes impresas por lo menos en una superficie del sustrato; (c) una capa transparente formada en por lo menos una superficie del sustrato por
15 encima de la capa de imagen gráfica; y (d) una pluralidad de lentes poligonales formadas en la capa transparente por encima de la capa de imagen gráfica, en donde las lentes poligonales son lentes convexas, de amplificación, claras.

Modalidad 26. Un artículo impreso que comprende:
20 (a) un sustrato transparente que tiene una superficie superior y una superficie inferior; (b) una capa de imagen gráfica que comprende una pluralidad de imágenes impresas en la superficie inferior del sustrato; y (c) una pluralidad de lentes poligonales impresos en la superficie superior del

sustrato, en donde las lentes poligonales son lentes convexas, de amplificación, claras.

Modalidad 27. Un método para formar un artículo impreso, el método que comprende: (a) imprimir una capa de
5 imagen gráfica que comprende una pluralidad de imágenes por lo menos en una superficie de un sustrato; y (b) imprimir una pluralidad de lentes poligonales por lo menos en una superficie del sustrato por encima de la capa de imagen gráfica, en donde las lentes poligonales son lentes convexas,
10 de amplificación, claras.

Modalidad 28. Un artículo impreso formado por el método de la modalidad 27, en donde las lentes poligonales comprenden lentes hexagonales.

Modalidad 29. Un método para formar un artículo
15 impreso, el método que comprende: (a) imprimir una capa de imagen gráfica que comprende una pluralidad de imágenes por lo menos en una superficie de un sustrato; (b) revestir la capa de imagen gráfica con una capa transparente; y (c) formar una pluralidad de lentes poligonales en la capa
20 transparente, en donde las lentes poligonales son lentes convexas, de amplificación, claras.

Modalidad 30. Un artículo impreso formado por el método de la modalidad 29, en donde las lentes poligonales comprenden lentes hexagonales.

EJEMPLOS

Ahora se hace referencia a la Solicitud Norteamericana No. 12/026,069, presentada el 5 de febrero de 2008, de la cual el contenido se incorpora en la presente para referencia en su totalidad. También se hace referencia a los siguientes ejemplos, los cuales son ilustrativos y no se pretenden para limitar el alcance de la materia objeto reclamada.

Ahora con referencia a la FIGURA 1, se muestra una vista en corte transversal de una primera modalidad de un artículo **10** impreso producido de acuerdo con la presente invención y se representa en una base más agrandada sobre el tamaño típico. En esta modalidad, el artículo **10** impreso incluye un sustrato **12** que tiene una superficie **14** superior y una superficie **16** inferior. El sustrato **12** puede formarse de papel, cartón, plástico, acrílico, vidrio, metal o cualquier otro material en el que se pueda imprimir. Una capa **18** de preferencia se imprime o se lamina, con una tinta reflectiva sobre toda o una porción de la superficie **14** superior del sustrato **12**. Aunque una capa reflectiva se prefiere, se apreciará que los métodos descritos logran efectos visuales increíbles utilizando sustratos de papel simple. La capa **18** puede ser clara o tener cualquier color. La capa **18** puede ser opaca, transparente, semitransparente o traslúcida. La capa

18 de preferencia proporciona al artículo impreso una apariencia metálica brillante o brillosa. Alternativamente, la capa **18** reflectiva puede formarse de una película de cromo, una película de difracción, una película metálica, una película holográfica, película de laminación, o cualquier material metalizado que tenga una superficie brillante.

Un diseño gráfico o imagen **20** se imprime sobre toda o una porción de la capa **18**. El diseño gráfico puede incluir una macro-imagen (por ejemplo, una figura deportiva) y una disposición de imágenes (por ejemplo, una imagen **22** de micro-diseño). Subsecuentemente, se imprime una disposición de lentes **29** poligonales transparentes sobre la capa **20**. La frecuencia y colocación de las lentes **29** se seleccionan para ampliar porciones de la imagen de micro-diseño para desplegar una imagen compuesta que parece que flota sobre la superficie del artículo impreso.

Las lentes **29** pueden formarse sobre la superficie completa de la imagen **20** o sólo sobre una porción de la misma. Las lentes **29** pueden formarse a partir de una tinta transparente adecuada para su uso en esta aplicación, impresa en la parte superior del diseño gráfico o la imagen **20** por un método de impresión tal como serigrafía, litografía, flexografía, impresión offset, grabado, revestimiento u otro método de impresión conocido. Esta tinta transparente de

preferencia es una tinta curable por UV. La tinta transparente también puede incluir hojuelas de brillo, o perlas, u otros materiales para producir un efecto de "brillo" en el artículo impreso.

5 Un método preferido para formar el diseño **20** gráfico y la imagen **22** de micro-diseño es a través de un proceso de impresión offset. El diseño **20** gráfico puede imprimirse con tinta opaca, tinta semi-transparente, tinta translúcida, o cualquier combinación de las mismas. Estas
10 tintas de preferencia se pueden curar en respuesta a la luz ultravioleta (UV). Otros métodos para formar el diseño **20** gráfico y la imagen **22** de micro-diseño incluyen serigrafía, litografía, flexografía, grabado u otros métodos de impresión conocidos.

15 La FIGURA 2 demuestra la apariencia visual de un artículo **10** impreso cuando se ve desde la parte izquierda y la FIGURA 3 demuestra la apariencia visual cuando se ve desde la parte derecha. Un diseño gráfico impreso en la superficie superior del artículo incluye una figura **30** deportiva. La
20 pluralidad de lentes poligonales se representa por lentes hexagonales que exageran mucho en tamaño con respecto al tamaño típico de un artículo impreso. La imagen **22** de micro-diseño (micro imágenes de globos en este ejemplo) se amplifica por las lentes hexagonales para formar las imágenes

62 compuestas, representadas por los globos que flotan sobre la superficie del artículo **10** impreso. La imagen **22** de micro-diseño (exagerada mucho en tamaño) se muestra en una vista en planta superior en la FIGURA 4.

5 Como se ilustra en la FIGURA 5, la orientación o ángulo θ_1 de las filas paralelas de las lentes hexagonales pueden ajustar o seleccionarse con respecto a la dirección de errores observados en el proceso de impresión para minimizar y compensar estos errores. Ejemplos de tales errores son

10 direcciones de impresión, corte, movimiento del rodillo de goma, y errores del anilox o impresión por grabado; errores de salida de película; y errores de procesamiento de imagen de cuadrícula digital. El resultado de seleccionar la orientación en estas bases puede lograr una mayor altura de

15 textura y un agrupamiento más cercano de las lentes hexagonales. El espacio entre las lentes hexagonales en este ejemplo se representa por **S** y el ancho de las lentes hexagonales se representada por **W** de lentes hexagonales transparentes en la FIGURA 5. La orientación y forma

20 geométrica de las lentes transparentes puede seleccionarse para evitar inundación, sangrado y/o flujo indeseables de las lentes, en este ejemplo, es de un hexágono al siguiente.

La orientación o ángulo θ_1 de las filas paralelas de las lentes hexagonales puede ajustarse para corregir o

minimizar la ocurrencia de errores durante la impresión de las lentes. Por ejemplo, pueden presentarse errores cuando una imagen se traslada digitalmente sobre una placa de impresión o sobre una cabeza de impresión de chorro de tinta. En algunos casos, la dirección del chorro de tinta puede provocar la aspersión de la tinta para que sea más gruesas que la precisa en la dirección de la cabeza de chorro de tinta conforme se esparce (por ejemplo, donde las líneas verticalmente aplicadas son más gruesas que las líneas horizontalmente aplicadas). Similarmente, un láser que quema imágenes sobre una placa de impresión puede mostrar errores de impresión direccionales en las direcciones vertical u horizontal. Los errores mecánicos también pueden observarse durante la impresión. Por ejemplo, la fuerza sobre la tinta durante el proceso de impresión (por ejemplo, el rodillo de goma que esparce la tinta a través de un tamiz) o la fuerza durante cualquier otro método para aplicar la tinta del clara puede provocar que la tinta sea más gruesa en la dirección de la fuerza. Seleccionar direcciones de impresión diferentes a la horizontal o vertical puede minimizar estos errores (por ejemplo, una dirección de impresión de 30, 45 ó 60 grados). Además, seleccionar hexágonos apilados a 60 grados puede promediar estas diferencias observadas vertical/horizontal y puede permitir un agrupamiento óptimo de las lentes dentro de

la disposición donde se minimiza el espacio muerto.

La FIGURA 6 demuestra otra modalidad de la presente invención donde un artículo **10** impreso incluye un sustrato **212** que puede o no imprimirse con una imagen **220** gráfica sobre la superficie **214**. Una disposición de imágenes o una imagen **260** de micro-diseño también se imprime sobre la superficie **214** y sobre una porción de la imagen **220** gráfica. Una capa **230** transparente se aplica parcial o completamente sobre la superficie de la imagen **220** gráfica y la imagen **260** de micro-diseño y las lentes **229** transparentes se imprimen subsecuentemente o se forman sobre toda o una porción de la superficie de la capa **230** transparente. La capa **230** transparente proporciona una distancia adicional entre las lentes **229** transparentes y la imagen **260** de micro-diseño y pueden incrementar el efecto de amplificación.

Una modalidad adicional se muestra en la FIGURA 7, donde un sustrato **312** transparente puede o no imprimirse con una imagen **320** gráfica sobre la superficie **318**. Una disposición de imágenes o una imagen **360** de micro-diseño también se imprime sobre la superficie **318**. Las lentes **329** transparentes se imprimen subsecuentemente sobre toda o una porción de la superficie **322** opuesta del sustrato **312** transparente. El sustrato **312** transparente proporciona una distancia adicional entre las lentes **329** transparentes y la

imagen **360** de micro-diseño y puede incrementar el efecto de amplificación.

El diseño **20** gráfico puede tener cualquier forma deseada, por ejemplo, un futbolista en una tarjeta de crédito
5 segura como se muestra en la FIGURA 2, o cualquier otra imagen. El diseño **20** gráfico puede comprender una pluralidad de capas de tinta para proporcionar una apariencia deseada. El diseño **20** gráfico también puede incluir una imagen **28** oculta o latente visible en la FIGURA 8 cuando se ve desde
10 una vista sustancialmente no plana (como se representa por los globos flotantes) y no visible en la FIGURA 9 como se ve en perspectiva de planta superior.

En la FIGURA 10, las lentes **429** transparentes se imprimen de modo que sustancialmente son planas **480** y semi-
15 circulares sobre la periferia **470** de la lente cuando se ve en la sección transversal.

En la FIGURA 11, las lentes **29** transparentes se imprimen sobre la superficie superior de un sustrato **12** transparente y las imágenes **360** de micro-diseño se imprimen
20 sobre la superficie inferior del sustrato **12** transparente. Las lentes tienen un ancho (W) promedio (véase también FIGURA 5, W), y una altura (H) promedio (véase también FIGURA 5, H). (La altura alternativamente puede denominarse como el "espesor central" o "hundimiento"). Las lentes de la

disposición tienen un espaciado (S) promedio. Las lentes tienen una distancia focal (f) promedio, que corresponde aproximadamente con el espesor del sustrato transparente. En algunas modalidades, la altura (H) de las lentes transparentes es de aproximadamente 0.0001 a 0.0100 pulgadas, el espacio (S) entre las lentes es de aproximadamente 0.001 a 0.010 pulgadas, y las lentes son hexagonales cuando se ven desde una vista en perspectiva plana superior y 0.0001 a 0.010 pulgadas de ancho (W) como se muestra en una vista en planta superior (véase también la FIGURA 5). La imagen de micro-diseño de preferencia se comprende de una pluralidad de formas impresas o colores orientados en una frecuencia y dirección de modo que cada una de las lentes individuales amplifica una porción de la imagen de micro-diseño para crear una imagen compuesta que parece que flota sobre la superficie del artículo impreso.

En algunas modalidades, las lentes impresas son hexagonales desde una vista en planta superior y tienen un ancho (W) de lado a lado promedio (véase FIGURA 5 y FIGURA 11) de 0.0005 a 0.0100 pulgadas (es decir, 12.7 a 254 micrones), y una altura promedio (H) (es decir, un "espesor central máximo" o "hundimiento") (véase FIGURA 11) de aproximadamente 0.0001 a 0.0050 pulgadas (es decir, 2.54 a 127 micrones). Las lentes impresas pueden tener un espaciado

(S) promedio en la disposición (véase FIGURA 5 y FIGURA 11) de aproximadamente 0.0005 a 0.0100 pulgadas (es decir, 2.54 a 254 micrones). Las lentes impresas pueden tener una longitud focal (f) promedio (véase FIGURA 11) de aproximadamente 5 0.0010 a 0.0500 pulgadas (es decir, 25.4 a 1270 micrones). Las lentes pueden imprimirse en un sustrato **12** transparente que tiene un ancho promedio que se aproxima a la longitud focal (f) de la lente. El sustrato **12** transparente puede tener un ancho promedio de aproximadamente 0.0010 a 0.0500 10 pulgadas (es decir, 25.4 a 1270 micrones).

En la descripción anterior, ciertos términos se han utilizado para brevedad, claridad y entendimiento. No se implicarán limitaciones innecesarias a partir de la misma más allá del requerimiento de la técnica anterior. Las diferentes 15 configuraciones, sistemas y etapas de método descritos en la presente pueden utilizarse solos o en combinación con otras configuraciones, sistemas y etapas de método. Se esperará que varios equivalentes, alternativas y modificaciones sean posibles dentro del alcance de las reivindicaciones anexas.

NOVEDAD DE LA INVENCION

Habiendo descrito la presente invención se considera como novedad y por lo tanto se reclama como propiedad lo descrito en las siguientes:

5

REIVINDICACIONES

1. Un artículo impreso caracterizado porque comprende:

(a) un sustrato que tiene una superficie superior y
10 una superficie inferior;

(b) una capa de imagen gráfica que comprende una pluralidad de imágenes impresas por lo menos en una superficie del sustrato; y

(c) una pluralidad de lentes poligonales impresos
15 por lo menos en una superficie del sustrato sobre la capa de imagen gráfica, en donde las lentes poligonales son lentes convexas, de amplificación, claras.

2. El artículo impreso de conformidad con la reivindicación 1, se caracteriza porque la pluralidad de
20 lentes poligonales comprende lentes poligonales seleccionadas del grupo que consiste de lentes hexagonales, lentes cuadradas, lentes rectangulares, y lentes romboides.

3. El artículo impreso de conformidad con la reivindicación 1 ó 2, se caracteriza porque las lentes

poligonales comprenden lentes hexagonales.

4. El artículo impreso de conformidad con cualquiera de las reivindicaciones 1 a 3, se caracteriza porque las lentes poligonales son semicirculares en sección transversal.

5. El artículo impreso de conformidad con cualquiera de las reivindicaciones 1 a 4, se caracteriza porque las lentes poligonales son sustancialmente planas en sección transversal.

6. El artículo impreso de conformidad con cualquiera de las reivindicaciones 1 a 5, se caracteriza porque la pluralidad de imágenes comprende una imagen de micro-diseño.

7. El artículo impreso de conformidad con cualquiera de las reivindicaciones 1 a 6, se caracteriza porque la pluralidad de lentes poligonales se orientan sobre la pluralidad de imágenes de modo que cada lente amplifica una porción de una imagen para desplegar por lo menos una imagen compuesta.

8. El artículo impreso de conformidad con cualquiera de las reivindicaciones 1 a 7, se caracteriza porque la pluralidad de lentes se imprimen individualmente en el sustrato.

9. El artículo impreso de conformidad con

cualquiera de las reivindicaciones 1 a 8, se caracteriza porque la pluralidad de imágenes comprende una disposición de imágenes y la pluralidad de lentes comprende una disposición de lentes.

5 10. El artículo impreso de conformidad con la reivindicación 9, se caracteriza porque:

la disposición de lentes tiene una frecuencia de lentes;

10 la disposición de imágenes tiene una frecuencia de imágenes; y

la frecuencia de lentes es mayor que la frecuencia de imágenes.

11. El artículo impreso de conformidad con la reivindicación 9, se caracteriza porque:

15 la disposición de lentes tiene una frecuencia de lentes;

la disposición de imágenes tiene una frecuencia de imágenes; y

20 la frecuencia de lentes es menor que la frecuencia de las imágenes.

12. El artículo impreso de conformidad con la reivindicación 9, se caracteriza porque:

la disposición de lentes tiene una frecuencia de lentes;

la disposición de imágenes tiene una frecuencia de imágenes; y

la frecuencia de lentes es la misma que la frecuencia de imágenes.

5 13. El artículo impreso de conformidad con la reivindicación 9, se caracteriza porque la disposición de imágenes comprende una imagen de micro-diseño.

14. El artículo impreso de conformidad con cualquiera de las reivindicaciones 1 a 13, se caracteriza
10 además porque comprende:

(d) una segunda capa de imagen gráfica impresa por lo menos en una superficie del sustrato.

15 15. El artículo impreso de conformidad con cualquiera de las reivindicaciones 1 a 14, caracteriza porque el sustrato es transparente.

16. El artículo impreso de conformidad con la reivindicación 15, se caracteriza porque la capa de imagen gráfica se imprime en la superficie inferior del sustrato.

17. El artículo impreso de conformidad con
20 cualquiera de las reivindicaciones 1 a 16, se caracteriza porque las lentes impresas tienen una altura de entre 0.0001-0.0050 pulgadas, un ancho entre 0.0005-0.0100 pulgadas, y un espacio entre las lentes de entre 0.0005-0.0100 pulgadas.

18. Un artículo impreso caracterizado porque

comprende:

(a) un sustrato que tiene una superficie superior y una superficie inferior;

5 (b) una capa de imagen gráfica que comprende una pluralidad de imágenes impresas por lo menos en una superficie del sustrato;

(c) una capa transparente formada por lo menos en una superficie del sustrato sobre la capa de imagen gráfica; y

10 (d) una pluralidad de lentes poligonales formadas en la capa transparente sobre la capa de imagen gráfica, en donde las lentes poligonales son lentes convexas, de amplificación, claras.

15 19. El artículo impreso de conformidad con la reivindicación 18, se caracteriza porque las lentes impresas tienen una altura de entre 0.0001-0.0050 pulgadas, un ancho entre 0.0005-0.0100 pulgadas, y un espacio entre las lentes de entre 0.0005-0.0100 pulgadas.

20 20. Un artículo impreso caracterizado porque comprende:

(a) un sustrato transparente que tiene una superficie superior y una superficie inferior;

(b) una capa de imagen gráfica que comprende una pluralidad de imágenes impresas en la superficie inferior del

sustrato; y

(c) una pluralidad de lentes poligonales impresos en la superficie superior del sustrato, donde las lentes poligonales son lentes convexas, de amplificación, claras.

5 21. El artículo impreso de conformidad con la reivindicación 20, se caracteriza porque las lentes impresas tienen una altura de entre 0.0001-0.0050 pulgadas, un ancho entre 0.0005-0.0100 pulgadas, y un espacio entre las lentes de entre 0.0005-0.0100 pulgadas.

10 22. Un método para formar un artículo impreso, el método caracterizado porque comprende:

(a) imprimir una capa de imagen gráfica que comprende una pluralidad de imágenes por lo menos en una superficie de un sustrato; y

15 (b) imprimir una pluralidad de lentes poligonales por lo menos en una superficie del sustrato sobre la capa de imagen gráfica, en donde las lentes poligonales son lentes convexas, de amplificación, claras.

20 23. El método de la reivindicación 22, se caracteriza porque las lentes impresas se disponen en filas paralelas desplazadas y el método además comprende ajustar la orientación del ángulo θ de las filas paralelas desplazadas para evitar inundación durante la impresión de las lentes.

24. Un artículo impreso formado por el método de

conformidad con la reivindicación 22 ó 23, se caracteriza porque las lentes poligonales comprenden lentes hexagonales.

25. Un método para formar un artículo impreso, el método caracterizado porque comprende:

5 (a) imprimir una capa de imagen gráfica que comprende una pluralidad de imágenes por lo menos en una superficie de un sustrato;

 (b) revestir la capa de imagen gráfica con una capa transparente; y

10 (c) formar una pluralidad de lentes poligonales en la capa transparente, donde las lentes poligonales son lentes convexas, de amplificación, claras.

26. El método de conformidad con la reivindicación 25, se caracteriza porque

15 las lentes impresas se disponen en filas paralelas desplazadas y el método además comprende ajustar la orientación del ángulo θ de las filas paralelas desplazadas para evitar inundación durante la impresión de las lentes.

27. Un artículo impreso formado por el método de
20 conformidad con la reivindicación 25 ó 26, se caracteriza porque las lentes poligonales comprenden lentes hexagonales.

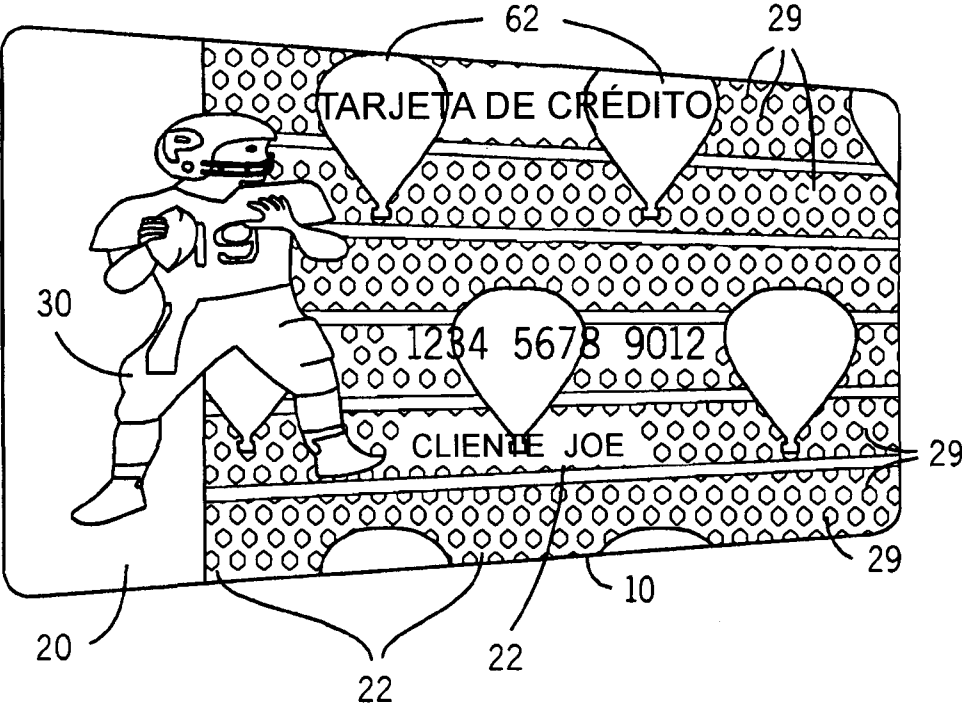


FIG. 2

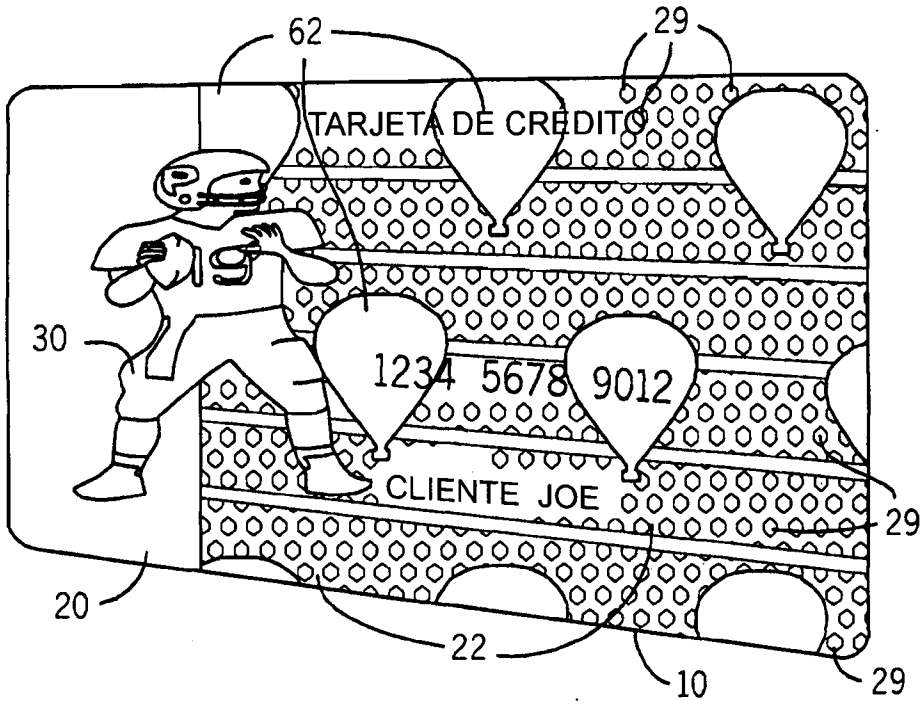


FIG. 3

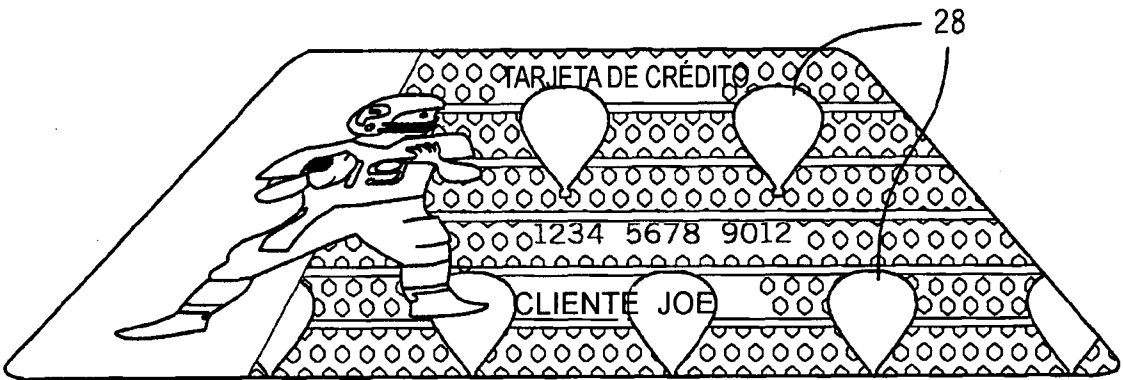


FIG. 8

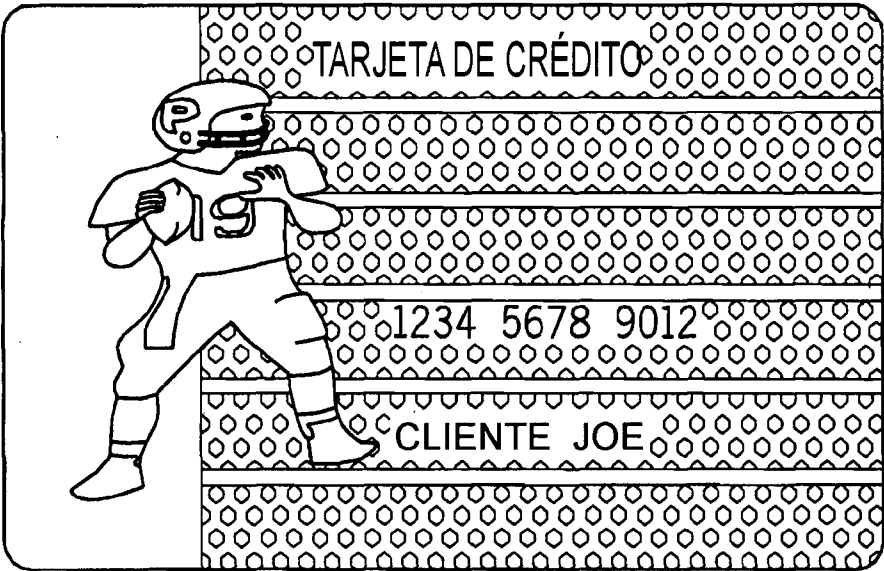


FIG. 9

PCT

REQUEST

The undersigned requests that the present international application be processed according to the Patent Cooperation Treaty.

For receiving Office use only

International Application No.

International Filing Date

Name of receiving Office and "PCT International Application"

Applicant's or agent's file reference (if desired) (12 characters maximum) 1094-00251

Box No. I TITLE OF INVENTION	
Printed Article for Displaying Images Having Improved Definition and Depth	
Box No. II APPLICANT ☐ This person is also inventor	
Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.) Serigraph, Inc. 3801 East Decorah Road West Bend, Wisconsin 53095 USA	
Telephone No.	
Facsimile No.	
Applicant's registration No. with the Office	
State (that is, country) of nationality: US	State (that is, country) of residence: US
This person is applicant for the purposes of: ☐ all designated States ☒ all designated States except the United States of America ☐ the United States of America only ☐ the States indicated in the Supplemental Box	
Box No. III FURTHER APPLICANT(S) AND/OR (FURTHER) INVENTOR(S)	
☒ Further applicants and/or (further) inventors are indicated on a continuation sheet.	
Box No. IV AGENT OR COMMON REPRESENTATIVE; OR ADDRESS FOR CORRESPONDENCE	
The person identified below is hereby/has been appointed to act on behalf of the applicant(s) before the competent International Authorities as: ☒ agent ☐ common representative	
Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.) MCBRIDE, M. Scott Andrus, Sceales, Starke & Sawall, LLP 100 East Wisconsin Avenue, Suite 1100 Milwaukee, WI 53202-4178 USA	
Telephone No. 414-271-7590	
Facsimile No. 414-271-5770	
Agent's registration No. with the Office 52,008	
☐ Address for correspondence: Mark this check-box where no agent or common representative is/has been appointed and the space above is used instead to indicate a special address to which correspondence should be sent.	

Box No. III FURTHER APPLICANT(S) AND/OR (FURTHER) INVENTOR(S) <i>If none of the following sub-boxes is used, this sheet should not be included in the request.</i>	
Name and address: <i>(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)</i> SCARBROUGH, Joel Scott 1848 East Vista Terrace Lindenhurst, Illinois 60046 USA	This person is: ☐ applicant only ☒ applicant and inventor ☐ inventor only <i>(If this check-box is marked, do not fill in below.)</i> Applicant's registration No. with the Office
State (that is, country) of nationality: US	State (that is, country) of residence: US
This person is applicant for the purposes of: ☐ all designated States ☐ all designated States except the United States of America ☒ the United States of America only ☐ the States indicated in the Supplemental Box	
Name and address: <i>(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)</i> 	This person is: ☐ applicant only ☐ applicant and inventor ☐ inventor only <i>(If this check-box is marked, do not fill in below.)</i> Applicant's registration No. with the Office
State (that is, country) of nationality:	State (that is, country) of residence:
This person is applicant for the purposes of: ☐ all designated States ☐ all designated States except the United States of America ☐ the United States of America only ☐ the States indicated in the Supplemental Box	
Name and address: <i>(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)</i> 	This person is: ☐ applicant only ☐ applicant and inventor ☐ inventor only <i>(If this check-box is marked, do not fill in below.)</i> Applicant's registration No. with the Office
State (that is, country) of nationality:	State (that is, country) of residence:
This person is applicant for the purposes of: ☐ all designated States ☐ all designated States except the United States of America ☐ the United States of America only ☐ the States indicated in the Supplemental Box	
Name and address: <i>(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)</i> 	This person is: ☐ applicant only ☐ applicant and inventor ☐ inventor only <i>(If this check-box is marked, do not fill in below.)</i> Applicant's registration No. with the Office
State (that is, country) of nationality:	State (that is, country) of residence:
This person is applicant for the purposes of: ☐ all designated States ☐ all designated States except the United States of America ☐ the United States of America only ☐ the States indicated in the Supplemental Box	
Name and address: <i>(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)</i> 	This person is: ☐ applicant only ☐ applicant and inventor ☐ inventor only <i>(If this check-box is marked, do not fill in below.)</i> Applicant's registration No. with the Office
State (that is, country) of nationality:	State (that is, country) of residence:
This person is applicant for the purposes of: ☐ all designated States ☐ all designated States except the United States of America ☐ the United States of America only ☐ the States indicated in the Supplemental Box	
☐ Further applicants and/or (further) inventors are indicated on another continuation sheet.	

Supplemental Box*If the Supplemental Box is not used, this sheet should not be included in the request.*

- I. *If, in any of the Boxes, except Boxes Nos. VIII(i) to (v) for which a special continuation box is provided, the space is insufficient to furnish all the information: in such case, write "Continuation of Box No." (indicate the number of the Box) and furnish the information in the same manner as required according to the captions of the Box in which the space was insufficient, in particular:*
 - (i) *if more than one person is to be indicated as applicant and/or inventor and no "continuation sheet" is available: in such case, write "Continuation of Box No. III" and indicate for each additional person the same type of information as required in Box No. III. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below;*
 - (ii) *if, in Box No. II or in any of the sub-boxes of Box No. III, the indication "the States indicated in the Supplemental Box" is checked: in such case, write "Continuation of Box No. II" or "Continuation of Box No. III" or "Continuation of Boxes No. II and No. III" (as the case may be), indicate the name of the applicant(s) involved and, next to (each) such name, the State(s) (and/or, where applicable, ARIPO, Eurasian, European or OAPI patent) for the purposes of which the named person is applicant;*
 - (iii) *if, in Box No. II or in any of the sub-boxes of Box No. III, the inventor or the inventor/applicant is not inventor for the purposes of all designated States or for the purposes of the United States of America: in such case, write "Continuation of Box No. II" or "Continuation of Box No. III" or "Continuation of Boxes No. II and No. III" (as the case may be), indicate the name of the inventor(s) and, next to (each) such name, the State(s) (and/or, where applicable, ARIPO, Eurasian, European or OAPI patent) for the purposes of which the named person is inventor;*
 - (iv) *if, in addition to the agent(s) indicated in Box No. IV, there are further agents: in such case, write "Continuation of Box No. IV" and indicate for each further agent the same type of information as required in Box No. IV;*
 - (v) *if, in Box No. VI, there are more than three earlier applications whose priority is claimed: in such case, write "Continuation of Box No. VI" and indicate for each additional earlier application the same type of information as required in Box No. VI.*
2. *If the applicant intends to make an indication of the wish that the international application be treated, in certain designated States, as an application for a patent of addition, certificate of addition, inventor's certificate of addition or utility certificate of addition: in such a case, write the name or two-letter code of each designated State concerned and the indication "patent of addition," "certificate of addition," "inventor's certificate of addition" or "utility certificate of addition," the number of the parent application or parent patent or other parent grant and the date of grant of the parent patent or other parent grant or the date of filing of the parent application (Rules 4.11(a)(iii) and 49bis.1(a) or (b)).*
3. *If the applicant intends to make an indication of the wish that the international application be treated, in the United States of America, as a continuation or continuation-in-part of an earlier application: in such a case, write "United States of America" or "US" and the indication "continuation" or "continuation-in-part" and the number and the filing date of the parent application (Rules 4.11(a)(iv) and 49bis.1(d)).*

CONTINUATION OF BOX NO. IV:
 FETTERLEY, Daniel D.; Reg. No. 20,323;
 SOLVESON, George H.; Reg. No. 25,927;
 ESSMANN, Gary A.; Reg. No. 29,376;
 WOZNY, Thomas M.; Reg. No. 28,922;
 TAKEN, Michael E.; Reg. No. 28,120;
 JOCHMAN, Joseph J.; Reg. No. 25,058;
 KUBORN, Joseph D.; Reg. No. 40,689;
 WILLIAMS, Edward J. Jr.; Reg. No. 38,057;
 SCHERER, Christopher M.; Reg. No. 50,655;
 HOLSEN, Peter T.; Reg. No. 54,180;
 OLEJNICZAK, Aaron T.; Reg. No. 54,853;
 IMHOFF, Benjamin R.; Reg. No. 60,038
 McBRIDE, M. Scott; Reg. No. 52,008
 FALK, William L.; Reg. No. 27,708;
 all of ANDRUS, SCEALES, STARKE & SAWALL, LLP
 100 East Wisconsin Avenue, Suite 1100,
 Milwaukee, Wisconsin 53202-4178
 United States of America,
 Phone: 414-271-7590
 Facsimile: 414-271-5770

Box No. V DESIGNATIONS				
The filing of this request constitutes under Rule 4.9(a), the designation of all Contracting States bound by the PCT on the international filing date, for the grant of every kind of protection available and, where applicable, for the grant of both regional and national patents. However, ☐ DE Germany is not designated for any kind of national protection ☐ JP Japan is not designated for any kind of national protection ☐ KR Republic of Korea is not designated for any kind of national protection ☐ RU Russian Federation is not designated for any kind of national protection <i>(The check-boxes above may only be used to exclude (irrevocably) the designations concerned if, at the time of filing or subsequently under Rule 26bis.1, the international application contains in Box No. VI a priority claim to an earlier national application filed in the particular State concerned, in order to avoid the ceasing of the effect, under the national law, of this earlier national application.)</i>				
Box No. VI PRIORITY CLAIM				
The priority of the following earlier application(s) is hereby claimed:				
Filing date of earlier application <i>(day/month/year)</i>	Number of earlier application	Where earlier application is:		
		national application: country or Member of WTO	regional application: regional Office	international application: receiving Office
item (1) 05/02/2008	12/026,069	US		
item (2)				
item (3)				
☐ Further priority claims are indicated in the Supplemental Box.				
Transmit certified copy: the receiving Office is requested to prepare and transmit to the International Bureau a certified copy of the earlier application(s) <i>(only if the earlier application was filed with the Office which for the purposes of this international application is the receiving Office)</i> identified above as: ☐ all items ☒ item (1) ☐ item (2) ☐ item (3) ☐ other, see Supplemental Box				
Restore the right of priority: the receiving Office is requested to restore the right of priority for the earlier application(s) identified above or in the Supplemental Box as item(s) (). <i>(See also the Notes to Box No. VI; further information must be provided to support a request to restore the right of priority.)</i>				
Incorporation by reference: where an element of the international application referred to in Article 11(1)(iii)(d) or (e) or a part of the description, claims or drawings referred to in Rule 20.5(a) is not otherwise contained in this international application but is completely contained in an earlier application whose priority is claimed on the date on which one or more elements referred to in Article 11(1)(iii) were first received by the receiving Office, that element or part is, subject to confirmation under Rule 20.6, incorporated by reference in this international application for the purposes of Rule 20.6.				
Box No. VII INTERNATIONAL SEARCHING AUTHORITY				
Choice of International Searching Authority (ISA) <i>(if two or more International Searching Authorities are competent to carry out the international search, indicate the Authority chosen; the two-letter code may be used):</i> ISA / US				
Request to use results of earlier search; reference to that search <i>(if an earlier search has been carried out by or requested from the International Searching Authority):</i> Date (day/month/year) Number Country (or regional Office)				
Box No. VIII DECLARATIONS				
The following declarations are contained in Boxes Nos. VIII (i) to (v) <i>(mark the applicable check-boxes below and indicate in the right column the number of each type of declaration):</i>				Number of declarations
☐ Box No. VIII (i)	Declaration as to the identity of the inventor			:
☐ Box No. VIII (ii)	Declaration as to the applicant's entitlement, as at the international filing date, to apply for and be granted a patent			:
☐ Box No. VIII (iii)	Declaration as to the applicant's entitlement, as at the international filing date, to claim the priority of the earlier application			:
☐ Box No. VIII (iv)	Declaration of inventorship (only for the purposes of the designation of the United States of America)			:
☐ Box No. VIII (v)	Declaration as to non-prejudicial disclosures or exceptions to lack of novelty			:

Box No. IX CHECK LIST; LANGUAGE OF FILING																																																							
This international application contains: (a) on paper, the following number of sheets: <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 80%;">request (including declaration and supplemental sheets)</td> <td style="width: 20%; text-align: right;">5</td> </tr> <tr> <td>description (excluding sequence listing and/or tables related thereto)</td> <td style="text-align: right;">25</td> </tr> <tr> <td>claims</td> <td style="text-align: right;">5</td> </tr> <tr> <td>abstract</td> <td style="text-align: right;">1</td> </tr> <tr> <td>drawings</td> <td style="text-align: right;">10</td> </tr> <tr> <td>Sub-total number of sheets</td> <td style="text-align: right; border-top: 1px solid black;">46</td> </tr> <tr> <td>sequence listing</td> <td></td> </tr> <tr> <td>tables related thereto</td> <td></td> </tr> <tr> <td colspan="2"><i>(for both, actual number of sheets if filed on paper, whether or not also filed in electronic form; see (c) below)</i></td> </tr> <tr> <td>Total number of sheets</td> <td style="text-align: right; border-top: 1px solid black;">46</td> </tr> </table> (b) ☐ only in electronic form (Section 801(a)(i)) (i) ☐ sequence listing (ii) ☐ tables related thereto (c) ☐ also in electronic form (Section 801(a)(ii)) (i) ☐ sequence listing (ii) ☐ tables related thereto Type and number of carriers (diskette, CD-ROM, CD-R or other) on which are contained the ☐ sequence listing: ☐ tables related thereto: <i>(additional copies to be indicated under items 9(ii) and/or 10(ii), in right column)</i>	request (including declaration and supplemental sheets)	5	description (excluding sequence listing and/or tables related thereto)	25	claims	5	abstract	1	drawings	10	Sub-total number of sheets	46	sequence listing		tables related thereto		<i>(for both, actual number of sheets if filed on paper, whether or not also filed in electronic form; see (c) below)</i>		Total number of sheets	46	This international application is accompanied by the following item(s) (mark the applicable check-boxes below and indicate in right column the number of each item): <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 80%;">1. ☐ fee calculation sheet</td> <td style="width: 20%; text-align: right;">:</td> </tr> <tr> <td>2. ☐ original separate power of attorney</td> <td style="text-align: right;">:</td> </tr> <tr> <td>3. ☐ original general power of attorney</td> <td style="text-align: right;">:</td> </tr> <tr> <td>4. ☐ copy of general power of attorney; reference number, if any:</td> <td style="text-align: right;">:</td> </tr> <tr> <td>5. ☐ statement explaining lack of signature</td> <td style="text-align: right;">:</td> </tr> <tr> <td>6. ☐ priority document(s) identified in Box No. VI as item(s):</td> <td style="text-align: right;">:</td> </tr> <tr> <td>7. ☐ translation of international application into (language):</td> <td style="text-align: right;">:</td> </tr> <tr> <td>8. ☐ separate indications concerning deposited microorganism or other biological material</td> <td style="text-align: right;">:</td> </tr> <tr> <td>9. ☐ sequence listing in electronic form (indicate type and number of carriers)</td> <td style="text-align: right;">:</td> </tr> <tr> <td style="margin-left: 20px;">(i) ☐ copy submitted for the purposes of international search under Rule 13ter only (and not as part of the international application)</td> <td style="text-align: right;">:</td> </tr> <tr> <td style="margin-left: 20px;">(ii) ☐ (only where check-box (b)(i) or (c)(i) is marked in left column) additional copies including, where applicable, the copy for the purposes of international search under Rule 13ter</td> <td style="text-align: right;">:</td> </tr> <tr> <td style="margin-left: 20px;">(iii) ☐ together with relevant statement as to the identity of the copy or copies with the sequence listing mentioned in left column</td> <td style="text-align: right;">:</td> </tr> <tr> <td>10. ☐ tables in electronic form related to sequence listing (Indicate type and number of carriers)</td> <td style="text-align: right;">:</td> </tr> <tr> <td style="margin-left: 20px;">(i) ☐ copy submitted for the purposes of international search under Section 802(b-quater) only (and not as part of the international application)</td> <td style="text-align: right;">:</td> </tr> <tr> <td style="margin-left: 20px;">(ii) ☐ (only where check-box (b)(ii) or (c)(ii) is marked in left column) additional copies including, where applicable, the copy for the purposes of international search under Section 802(b-quater)</td> <td style="text-align: right;">:</td> </tr> <tr> <td style="margin-left: 20px;">(iii) ☐ together with relevant statement as to the identity of the copy or copies with the tables mentioned in left column</td> <td style="text-align: right;">:</td> </tr> <tr> <td>11. ☐ other (specify):</td> <td style="text-align: right;">:</td> </tr> </table>	1. ☐ fee calculation sheet	:	2. ☐ original separate power of attorney	:	3. ☐ original general power of attorney	:	4. ☐ copy of general power of attorney; reference number, if any:	:	5. ☐ statement explaining lack of signature	:	6. ☐ priority document(s) identified in Box No. VI as item(s):	:	7. ☐ translation of international application into (language):	:	8. ☐ separate indications concerning deposited microorganism or other biological material	:	9. ☐ sequence listing in electronic form (indicate type and number of carriers)	:	(i) ☐ copy submitted for the purposes of international search under Rule 13ter only (and not as part of the international application)	:	(ii) ☐ (only where check-box (b)(i) or (c)(i) is marked in left column) additional copies including, where applicable, the copy for the purposes of international search under Rule 13ter	:	(iii) ☐ together with relevant statement as to the identity of the copy or copies with the sequence listing mentioned in left column	:	10. ☐ tables in electronic form related to sequence listing (Indicate type and number of carriers)	:	(i) ☐ copy submitted for the purposes of international search under Section 802(b-quater) only (and not as part of the international application)	:	(ii) ☐ (only where check-box (b)(ii) or (c)(ii) is marked in left column) additional copies including, where applicable, the copy for the purposes of international search under Section 802(b-quater)	:	(iii) ☐ together with relevant statement as to the identity of the copy or copies with the tables mentioned in left column	:	11. ☐ other (specify):	:
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Figure of the drawings which should accompany the abstract:	Language of filing of the international application: English																																																						
Box No. X SIGNATURE OF APPLICANT, AGENT OR COMMON REPRESENTATIVE <i>Next to each signature, indicate the name of the person signing and the capacity in which the person signs (if such capacity is not obvious from reading the request).</i>																																																							
SERIGRAPH, INC. By: Name: Michael A. Terlizzi Title: Sr. Vice President, New Product Development, POP Group																																																							

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1. Date of actual receipt of the purported international application:	2. Drawings: ☐ received: ☐ not received:
3. Corrected date of actual receipt due to later but timely received papers or drawings completing the purported international application:	
4. Date of timely receipt of the required corrections under PCT Article 11(2):	
5. International Searching Authority (if two or more are competent): ISA /	6. ☐ Transmittal of search copy delayed until search fee is paid
For International Bureau use only Date of receipt of the record copy by the International Bureau:	

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau



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13 August 2009 (13.08.2009)

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G02B 27/10 (2006.01)

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5 February 2009 (05.02.2009)

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(26) Publication Language: English

(30) Priority Data:
12/026,069 5 February 2008 (05.02.2008) US

(71) Applicant (for all designated States except US): **SERIGRAPH INC.** [US/US]; 3801 East Decorah Road, West Bend, WI 53095 (US).

(72) Inventor; and

(75) Inventor/Applicant (for US only): **SCARBROUGH, Joel, Scott** [US/US]; 1848 East Vista Terrace, Lindenhurst, IL 60046 (US).

(74) Agents: **MCBRIDE, M., Scott et al.**; Andrus, Sceales, Starke & Sawall, LLP, 100 East Wisconsin Avenue, Suite 1100, Milwaukee, WI 53202-4178 (US).

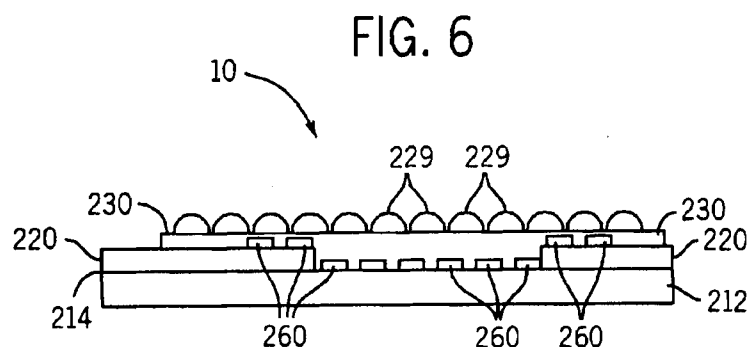
(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— with international search report (Art. 21(3))

(54) Title: PRINTED ARTICLE FOR DISPLAYING IMAGES HAVING IMPROVED DEFINITION AND DEPTH



(57) Abstract: Disclosed are printed articles and methods for manufacturing printed articles. The printed articles typically include: (a) a substrate having a top surface and a bottom surface; (b) a graphic image layer comprising a plurality of images printed on at least one surface of the substrate; and (c) a plurality of polygonal lenses printed or formed on at least one surface of the substrate above the graphic image layer, wherein the polygonal lenses are clear, magnifying, convex lenses. The lenses may selectively magnify portions of the array of images to create a plurality of images that appear and disappear or images that float under or on top of the graphic image when viewed from different perspectives.

WO 2009/100193 A1

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US2009/033179

A. CLASSIFICATION OF SUBJECT MATTER IPC(8) - G02B 27/10 (2009.01) USPC - 359/619 According to International Patent Classification (IPC) or to both national classification and IPC												
B. FIELDS SEARCHED Minimum documentation searched (classification system followed by classification symbols) IPC(8) - G02B 27/10 (2009.01) USPC - 359/618, 619, 620, 625-628; 283/72 Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) USPTO EAST System (US, USPG-PUB, EPO, DERWENT)												
C. DOCUMENTS CONSIDERED TO BE RELEVANT												
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.										
X ----- Y	US 2007/0058260 A1 (STEENBLIK et al) 15 March 2007 (15.03.2007) entire document	18, 25, 27 ----- 1-3, 19-24, 26										
Y	US 7,075,725 B2 (TOMCZYK) 11 July 2006 (11.07.2006) entire document	1-3, 19-24, 26										
Y	US 2006/0262411 A1 (DUNN et al) 23 November 2006 (23.11.2006) entire document	19, 21										
Y	AU 2006100412 A4 (LASORSA et al) 22 June 2006 (22.06.2006) entire document	23, 26										
☐ Further documents are listed in the continuation of Box C. ☐												
* Special categories of cited documents: <table border="0"><tr><td>"A" document defining the general state of the art which is not considered to be of particular relevance</td><td>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</td></tr><tr><td>"E" earlier application or patent but published on or after the international filing date</td><td>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone</td></tr><tr><td>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</td><td>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art</td></tr><tr><td>"O" document referring to an oral disclosure, use, exhibition or other means</td><td>"&" document member of the same patent family</td></tr><tr><td>"P" document published prior to the international filing date but later than the priority date claimed</td><td></td></tr></table>			"A" document defining the general state of the art which is not considered to be of particular relevance	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention	"E" earlier application or patent but published on or after the international filing date	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone	"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art	"O" document referring to an oral disclosure, use, exhibition or other means	"&" document member of the same patent family	"P" document published prior to the international filing date but later than the priority date claimed	
"A" document defining the general state of the art which is not considered to be of particular relevance	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention											
"E" earlier application or patent but published on or after the international filing date	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone											
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art											
"O" document referring to an oral disclosure, use, exhibition or other means	"&" document member of the same patent family											
"P" document published prior to the international filing date but later than the priority date claimed												
Date of the actual completion of the international search 17 March 2009		Date of mailing of the international search report 03 APR 2009										
Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US, Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-3201		Authorized officer: Blaine R. Copenheaver PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774										

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US2009/033179

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
3. ☒ Claims Nos.: 4-17
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying additional fees, this Authority did not invite payment of additional fees.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- ☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- ☐ No protest accompanied the payment of additional search fees.



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APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/026,069	10/27/2009	7609451	1094-00235	2422

26753 7590 10/07/2009
ANDRUS, SCEALES, STARKE & SAWALL, LLP
100 EAST WISCONSIN AVENUE, SUITE 1100
MILWAUKEE, WI 53202

ISSUE NOTIFICATION

The projected patent number and issue date are specified above.

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(application filed on or after May 29, 2000)

The Patent Term Adjustment is 0 day(s). Any patent to issue from the above-identified application will include an indication of the adjustment on the front page.

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (<http://pair.uspto.gov>).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Application Assistance Unit (AAU) of the Office of Data Management (ODM) at (571)-272-4200.

APPLICANT(s) (Please see PAIR WEB site <http://pair.uspto.gov> for additional applicants):

Joel Scott Scarbrough, Lindenhurst, IL;

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: **Mail** Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

26753 7590 07/13/2009
ANDRUS, SCEALES, STARKE & SAWALL, LLP
100 EAST WISCONSIN AVENUE, SUITE 1100
MILWAUKEE, WI 53202

Certificate of Mailing or Transmission
I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

Aleshia T. Prange	(Depositor's name)
<i>Aleshia T. Prange</i>	(Signature)
September 17, 2009	(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/026,069	02/05/2008	Joel Scott Scarbrough	1094-00235	2422

TITLE OF INVENTION: PRINTED ARTICLE FOR DISPLAYING IMAGES HAVING IMPROVED DEFINITION AND DEPTH

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	\$1510	\$0	\$0	\$1510	10/13/2009

EXAMINER	ART UNIT	CLASS-SUBCLASS
PINKNEY, DAWAYNE	2873	359-619000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363). ☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached. ☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. Use of a Customer Number is required.	2. For printing on the patent front page, list (1) the names of up to 3 registered patent attorneys or agents OR, alternatively, (2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.	1. Andrus, Sceales, Starke & Sawall, LLP 2. _____ 3. _____
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3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE Serigraph, Inc.	(B) RESIDENCE: (CITY and STATE OR COUNTRY) West Bend, Wisconsin
--	---

Please check the appropriate assignee category or categories (will not be printed on the patent): ☐ Individual ☒ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted: ☒ Issue Fee ☐ Publication Fee (No small entity discount permitted) ☐ Advance Order - # of Copies _____	4b. Payment of Fee(s): (Please first reapply any previously paid issue fee shown above) ☐ A check is enclosed. ☐ Payment by credit card. Form PTO-2038 is attached. ☒ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number 01.2000 (enclose an extra copy of this form).
---	---

5. Change in Entity Status (from status indicated above)
☐ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27. ☐ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature <i>M. Scott McBride</i>	Date September 17, 2009
Typed or printed name M. Scott McBride, Ph.D.	Registration No. 52,008

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

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NOTICE OF ALLOWANCE AND FEE(S) DUE

26753 7590 07/13/2009

ANDRUS, SCEALES, STARKE & SAWALL, LLP
100 EAST WISCONSIN AVENUE, SUITE 1100
MILWAUKEE, WI 53202

EXAMINER	
PINKNEY, DAWAYNE	
ART UNIT	PAPER NUMBER

2873

DATE MAILED: 07/13/2009

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/026,069	02/05/2008	Joel Scott Scarbrough	1094-00235	2422

TITLE OF INVENTION: PRINTED ARTICLE FOR DISPLAYING IMAGES HAVING IMPROVED DEFINITION AND DEPTH

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	\$1510	\$0	\$0	\$1510	10/13/2009

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. **PROSECUTION ON THE MERITS IS CLOSED.** THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN **THREE MONTHS** FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. **THIS STATUTORY PERIOD CANNOT BE EXTENDED.** SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the SMALL ENTITY status shown above.

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

A. If the status is the same, pay the TOTAL FEE(S) DUE shown above.

B. If the status above is to be removed, check box 5b on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and twice the amount of the ISSUE FEE shown above, or

If the SMALL ENTITY is shown as NO:

A. Pay TOTAL FEE(S) DUE shown above, or

B. If applicant claimed SMALL ENTITY status before, or is now claiming SMALL ENTITY status, check box 5a on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and 1/2 the ISSUE FEE shown above.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

95

Notice of Allowability	Application No.		Applicant(s)	
	12/026,069		SCARBROUGH, JOEL SCOTT	
	Examiner		Art Unit	
	DAWAYNE A. PINKNEY		2873	

– The MAILING DATE of this communication appears on the cover sheet with the correspondence address–
 All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to the amendment filed 06/25/2009.
2. ☒ The allowed claim(s) is/are 23-29.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).
 - * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892) 2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948) 3. ☐ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____ 4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material	5. ☐ Notice of Informal Patent Application 6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ 7. ☐ Examiner's Amendment/Comment 8. ☒ Examiner's Statement of Reasons for Allowance 9. ☐ Other _____
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/026,069	02/05/2008	Joel Scott Scarbrough	1094-00235	2422

26753 7590 07/13/2009

ANDRUS, SCEALES, STARKE & SAWALL, LLP
100 EAST WISCONSIN AVENUE, SUITE 1100
MILWAUKEE, WI 53202

EXAMINER

PINKNEY, DAWAYNE

ART UNIT

PAPER NUMBER

2873

DATE MAILED: 07/13/2009

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b) (application filed on or after May 29, 2000)

The Patent Term Adjustment to date is 0 day(s). If the issue fee is paid on the date that is three months after the mailing date of this notice and the patent issues on the Tuesday before the date that is 28 weeks (six and a half months) after the mailing date of this notice, the Patent Term Adjustment will be 0 day(s).

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (<http://pair.uspto.gov>).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

PART B - FEE(S) TRANSMITTAL

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Certificate of Mailing or Transmission
I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/026,069	02/05/2008	Joel Scott Scarbrough	1094-00235	2422

TITLE OF INVENTION: PRINTED ARTICLE FOR DISPLAYING IMAGES HAVING IMPROVED DEFINITION AND DEPTH

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	\$1510	\$0	\$0	\$1510	10/13/2009

EXAMINER	ART UNIT	CLASS-SUBCLASS
PINKNEY, DAWAYNE	2873	359-619000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).
☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
☒ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. Use of a Customer Number is required.

2. For printing on the patent front page, list
(1) the names of up to 3 registered patent attorneys or agents OR, alternatively,
(2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE (B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent): ☐ Individual ☐ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:

☐ Issue Fee
☐ Publication Fee (No small entity discount permitted)
☐ Advance Order - # of Copies _____

4b. Payment of Fee(s): (Please first reapply any previously paid issue fee shown above)

☐ A check is enclosed.
☐ Payment by credit card. Form PTO-2038 is attached.
☐ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. Change in Entity Status (from status indicated above)

☐ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27. ☐ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature _____

Date _____

Typed or printed name _____

Registration No. _____

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

DETAILED ACTION

Allowable Subject Matter

1. Claims 23-29 are allowed.
2. The following is an examiner's statement of reasons for allowance: none of the prior art either alone or in combination disclose or teach of the claimed combination of limitations to warrant a rejection under 35 USC 102 or 103. Specifically, in reference to independent claims 23-27, none of the prior art either alone or in combination disclose or teach of the claimed printed lens article specifically including, as the distinguishing feature(s) in combination with the other limitations the claimed "a height of between 0.0001-0.001 inches, a width from a top planar view between 0.0001-0.01 inches, and spacing between the lenses is between 0.001 to 0.01 inches."
3. Specifically, in reference to independent claims 28-29, none of the prior art either alone or in combination disclose or teach of the claimed printed lens article specifically including, as the distinguishing feature(s) in combination with the other limitations the claimed "the printed lenses are arranged in parallel rows and the method further comprises adjusting orientation θ of the parallel rows to prevent flooding during printing of the lenses."
4. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Application/Control Number: 12/026,069
Art Unit: 2873

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Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DAWAYNE A. PINKNEY whose telephone number is (571)270-1305. The examiner can normally be reached on Monday-Thurs. 8 a.m.- 4:30 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ricky Mack can be reached on (571) 272-2333. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Scott J. Sugarman/
Primary Examiner, Art Unit 2873

/DaWayne A Pinkney/
Examiner, Art Unit 2873
07/05/2009

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application No.	: 12/026,069	)	CERTIFICATION OF ELECTRONIC
		)	SUBMISSION
Applicant	: Joel Scott Scarbrough	)	
Filed	: February 5, 2008	)	I hereby certify that this correspondence is
		)	being submitted electronically with the
Title	: Printed Article for	)	United States Patent and Trademark Office's
	Displaying Images Having	)	electronic filing system (EFS Web) on this
	Improved Definition and	)	25th day of June, 2009.
	Depth	)	
		)	
TC/A.U.	: 2873	)	<u>Aleshia Prange</u> June 25, 2009
Examiner	: Dawayne Pinkney	)	Aleshia Prange Date
		)	
Docket No.	: 1094-00235	)	
Customer No.	: 26753	)	
Confirmation No.	: 2422	)	

AMENDMENT UNDER 37 C.F.R. 1.116

Mail Stop: AF
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

This document is responsive to the final Office Action mailed May 8, 2009 and is timely filed.

Please amend the application as set forth below.

Amendments to the Claims appear in the list of claims beginning on page 2 of this document.

Remarks begin on page 5 of this document.

Amendments to the Claims:

The following list of claims will replace all prior lists of claims in the application.

List of Claims:

1.-22. (Cancelled)

23. (Currently Amended) ~~The printed article of claim 1,~~ A printed article comprising:

- (a) a substrate having a top surface and a bottom surface;
- (b) a graphic image layer comprising a plurality of images printed on at least one surface of the substrate; and
- (c) a plurality of polygonal lenses printed on at least one surface of the substrate above the graphic image layer, wherein the polygonal lenses are clear, magnifying, convex lenses;

wherein the printed lenses have a height of between 0.0001-0.001 inches, a width from a top planar view between 0.0001-0.01 inches, and spacing between the lenses is between 0.001 to 0.01 inches.

24. (Currently Amended) ~~The printed article of claim 17,~~ A printed article comprising:

- (a) a substrate having a top surface and a bottom surface;
- (b) a graphic image layer comprising a plurality of images printed on at least one surface of the substrate;
- (c) a transparent layer formed on at least one surface of the substrate above the graphic image layer; and
- (d) a plurality of polygonal lenses formed on the transparent layer above the graphic image layer, wherein the polygonal lenses are clear, magnifying, convex lenses;

wherein the printed lenses have a height of between 0.0001-0.001 inches, a width from a top planar view between 0.0001-0.01 inches, and spacing between the lenses is between 0.001 to 0.01 inches.

25. (Currently Amended) ~~The printed article of claim 18;~~ A printed article comprising:

- (a) a transparent substrate having a top surface and a bottom surface;
- (b) a graphic image layer comprising a plurality of images printed on the bottom surface of the substrate; and
- (c) a plurality of polygonal lenses printed on the top surface of the substrate, wherein the polygonal lenses are clear, magnifying, convex lenses;

wherein the printed lenses have a height of between 0.0001-0.001 inches, a width from a top planar view between 0.0001-0.01 inches, and spacing between the lenses is between 0.001 to 0.01 inches.

26. (Currently Amended) ~~The method of claim 19;~~ A method of forming a printed article, the method comprising:

- (a) printing a graphic image layer comprising a plurality of images on at least one surface of a substrate; and
- (b) printing a plurality of polygonal lenses on at least one surface of the substrate above the graphic image layer, wherein the polygonal lenses are clear, magnifying, convex lenses;

wherein the printed lenses have a height of between 0.0001-0.001 inches, a width from a top planar view between 0.0001-0.01 inches, and spacing between the lenses is between 0.001 to 0.01 inches.

27. (Currently Amended) ~~The method of claim 21;~~ A method of forming a printed article, the method comprising:

- (a) printing a graphic image layer comprising a plurality of images on at least one surface of a substrate;
- (b) coating the graphic image layer with a transparent layer; and

- (c) forming a plurality of polygonal lenses on the transparent layer, wherein the polygonal lenses are clear, magnifying, convex lenses;

wherein the printed lenses have a height of between 0.0001-0.001 inches, a width from a top planar view between 0.0001-0.01 inches, and spacing between the lenses is between 0.001 to 0.01 inches.

28. (Currently Amended) ~~The method of claim 19,~~ A method of forming a printed article, the method comprising:

- (a) printing a graphic image layer comprising a plurality of images on at least one surface of a substrate; and
(b) printing a plurality of polygonal lenses on at least one surface of the substrate above the graphic image layer, wherein the polygonal lenses are clear, magnifying, convex lenses;

wherein the printed lenses are arranged in parallel rows and the method further comprises adjusting orientation θ of the parallel rows to prevent flooding during printing of the lenses.

29. (Currently Amended) ~~The method of claim 21,~~ A method of forming a printed article, the method comprising:

- (a) printing a graphic image layer comprising a plurality of images on at least one surface of a substrate;
(b) coating the graphic image layer with a transparent layer; and
(c) forming a plurality of polygonal lenses on the transparent layer, wherein the polygonal lenses are clear, magnifying, convex lenses;

wherein the printed lenses are arranged in parallel rows and the method further comprises adjusting orientation θ of the parallel rows to prevent flooding during printing of the lenses.

Application No. 12/026,069
Amendment Dated June 25, 2009
Reply to Office Action of May 8, 2009

REMARKS

Reconsideration of the application is requested in view of the foregoing amendments and for the following remarks.

I. Claim Amendments

Prior to this amendment, claims 1-29 were pending. Claims 1-22 are requested to be cancelled without disclaimer or prejudice to further prosecution on the merits. Applicant reserves the right to pursue the subject matter of the cancelled claims in a divisional, continuation, or national stage application. Claims 23-29 have been amended to incorporate the subject matter of the claims from which they depend. Because the claim amendments do not introduce new matter and otherwise are proper, entry thereof is requested. After entering the amendments, claims 23-29 are pending in the application.

II. Allowable Subject Matter

The Office Action indicates that claims 23-29 are allowable if rewritten in independent form including all of the limitations of the base claims and any intervening claims. Claims 23-29 have been rewritten in independent form including all of the limitation of their respective base claims. Claims 1-22 have been cancelled, obviating any rejection of these claims. For these reasons, allowance of the present application is requested.

Respectfully submitted,
ANDRUS, SCEALES, STARKE & SAWALL, LLP



M. Scott McBride, Ph.D.
Reg. No. 52,008
Customer No. 26753



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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/026,069	02/05/2008	Joel Scott Scarbrough	1094-00235	2422
26753 7590 05/08/2009 ANDRUS, SCEALES, STARKE & SAWALL, LLP 100 EAST WISCONSIN AVENUE, SUITE 1100 MILWAUKEE, WI 53202			EXAMINER PINKNEY, DAWAYNE	
			ART UNIT 2873	PAPER NUMBER
			MAIL DATE 05/08/2009	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	12/026,069	SCARBROUGH, JOEL SCOTT	
	Examiner	Art Unit	
	DAWAYNE A. PINKNEY	2873	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 February 2009.
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-29 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1-22 is/are rejected.
7) ☒ Claim(s) 23-29 is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) ☐ Notice of References Cited (PTO-892) | 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) ☐ Notice of Informal Patent Application |
| 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>02/13/2009 and 04/14/2009</u> . | 6) ☐ Other: _____ |

DETAILED ACTION

Information Disclosure Statement

1. The information disclosure statement (IDS) submitted on 02/13/2009 and 04/14/2009 has been considered by the examiner.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-4, and 6-22 are rejected under 35 U.S.C. 102(b) as being anticipated by Steenblik et al. (US 2005/0180020).

Regarding **claim 1**, Steenblik discloses, a printed article comprising:

(a) a substrate having a top surface and a bottom surface (5, 8 of Figs. 1a-1b);

(b) a graphic image layer comprising a plurality of images printed on at least one surface of the substrate (4 of Figs. 1a-1b); and

(c) a plurality of polygonal lenses printed on at least one surface of the substrate above the graphic image layer, wherein the polygonal lenses are clear, magnifying, convex lenses (1 of Figs. 1a-1b, and 3a-3i).

Regarding **claim 2**, Steenblik discloses, the printed article of claim 1, wherein the plurality of polygonal lenses comprises polygonal lenses selected from the group consisting of hexagon lenses, square lenses, rectangle lenses, and rhombus lenses (Figs. 3a-3i).

Regarding **claim 3**, Steenblik discloses, the printed article of claim 2, wherein the polygonal lenses comprise hexagon lenses (Figs. 3a-3i).

Regarding **claim 4**, Steenblik discloses, the printed article of claim 1, wherein the polygonal lenses are semi-circular in cross-section (1 of Figs. 1a-1b, and Figs. 3a-3i).

Regarding **claim 6**, Steenblik discloses, the printed article of claim 1, wherein the plurality of images comprises a micro-pattern image (4 of Figs. 1a-1b).

Regarding **claim 7**, Steenblik discloses, the printed article of claim 1, wherein the plurality of polygonal lenses are oriented above the plurality of images such that each lens magnifies a portion of an image to display at least one composite image (1 of Figs. 1a-1b).

Regarding **claim 8**, Steenblik discloses, the printed article of claim 1, wherein the plurality of lenses are individually printed on the substrate (1 of Figs. 1a-1b).

Regarding **claim 9**, Steenblik discloses, the primed article of claim 1, wherein the plurality of images comprises an array of images and the plurality of lenses comprises an array of lenses (1, 4 of Figs. 1a-1b).

Regarding **claim 10**, Steenblik discloses, the printed article of claim 9, wherein:

the array of lenses has a frequency of lenses (1 of Figs. 1a-1b);

the array of images has a frequency of images (4 of Figs. 1a-1b); and

the frequency of lenses is greater than the frequency of images (Paragraph 0079).

Regarding **claim 11**, Steenblik discloses, the primed article of claim 9, wherein:

the array of lenses has a frequency of lenses (1 of Figs. 1a-1b);

the array of images has a frequency of images (4 of Figs. 1a-1b); and

the frequency of lenses is less than the frequency of images (Paragraph 0079).

Regarding **claim 12**, Steenblik discloses, the printed article of claim 9, wherein:

the array of lenses has a frequency of lenses (1 of Figs. 1a-1b);

the array of images has a frequency of images (4 of Figs. 1a-1b); and

the frequency of lenses is the same as the frequency of images (Paragraph 0079).

Regarding **claim 13**, Steenblik discloses, the printed article of claim 9, wherein the array of images comprises a micro-pattern image (4 of Figs. 1a-1b).

Regarding **claim 14**, Steenblik discloses, the printed article of claim 1, further comprising:

(d) a second graphic image layer printed on at least one surface of the substrate (162, 164 of Fig. 10).

Regarding **claim 15**, Steenblik discloses, the printed article of claim 1, wherein the substrate is transparent (8 of Figs. 1a-1b).

Regarding **claim 16**, Steenblik discloses, the printed article of claim 15, wherein the graphic image layer is printed on the bottom surface of the substrate (4 of Figs. 1a-1b).

Regarding **claim 17**, Steenblik discloses, a printed article comprising:

(a) a substrate having a top surface and a bottom surface (8 of Figs. 1a-1b);

(b) a graphic image layer comprising a plurality of images printed on at least one surface of the substrate (4 of Figs. 1a-1b);

(c) a transparent layer formed on at least one surface of the substrate above the graphic image layer (5 of Figs. 1a-1b); and

(d) a plurality of polygonal lenses formed on the transparent layer above the graphic image layer, wherein the polygonal lenses are clear, magnifying, convex lenses (1 of Figs. 1a-1b).

Regarding **claim 18**, Steenblik discloses, a printed article comprising:

- (a) a transparent substrate having a top surface and a bottom surface (8 of Figs. 1a-1b);
- (b) a graphic image layer comprising a plurality of images printed on the bottom surface of the substrate (4 of Figs. 1a-1b); and
- (c) a plurality of polygonal lenses printed on the top surface of the substrate, wherein the polygonal lenses are clear, magnifying, convex lenses (1 of Figs. 1a-1b).

Regarding **claim 19**, Steenblik discloses, a method of forming a primed article, the method comprising:

- (a) printing a graphic image layer comprising a plurality of images on at least one surface of a substrate (4 of Figs. 1a-1b); and
- (b) priming a plurality of polygonal lenses on at least one surface of the substrate above the graphic image layer, wherein the polygonal lenses are clear, magnifying, convex lenses (1 of Figs. 1a-1b).

Regarding **claim 20**, Steenblik discloses, a primed article formed by the method of claim 19, wherein the polygonal lenses comprise hexagon lenses (Figs. 3a-3i).

Regarding **claim 21**, Steenblik discloses, a method of forming a printed article, the method comprising:

- (a) printing a graphic image layer comprising a plurality of images on at least one surface of a substrate (4 of Figs. 1a-1b);

(b) coating the graphic image layer with a transparent layer (5, 8 of Figs. 1a-1b); and
(c) forming a plurality of polygonal lenses on the transparent layer, wherein the polygonal lenses are clear, magnifying, convex lenses (1 of Figs. 1a-1b).

Regarding **claim 22**, Steenblik discloses, a primed article formed by the method of claim 21, wherein the polygonal lenses comprise hexagon lenses (Figs. 3a-3i).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Steenblik et al. (US 2005/0180020) as applied to claim 1 above.

Steenblik remains as applied to **claim 1 above**.

Although Steenblik does not specifically disclose the polygonal lenses are substantially flat in cross-section, change in form of any element of prior patent must result in more than useful natural phenomenon that man has accumulated through common knowledge; even though use of new device greatly improves field and provides great utility, and commercial success is enjoyed because of long-felt need, these features cannot sustain patentability where involved is only extended application of obvious attributes from prior art. *Span Deck Inc. v. Fab-Con, Inc.* (CA 8, 1982) 215 USPQ 835. Furthermore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to make the polygonal lenses are substantially flat in cross-section for the purpose of providing a printed article which contains hidden images.

Response to Arguments

6. Applicant's arguments filed 02/13/2009 have been fully considered but they are not persuasive.
7. In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., Printed lenses are formed by applying a liquid lens material to a surface of a substrate. As such, the dimensions of printed lenses are limited by a number of factors include viscosity and surface tension of the primed liquid lens material.) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).
8. In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., flat surface lenses may be utilized to create hidden images) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Allowable Subject Matter

9. Claims 23-29 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.
10. The following is a statement of reasons for the indication of allowable subject matter: none of the prior art either alone or in combination disclose or teach of the claimed combination of limitations to warrant a rejection under 35 USC 102 or 103. Specifically, in reference to

dependent claims 23-27, none of the prior art either alone or in combination disclose or teach of the claimed printed lens article specifically including, as the distinguishing feature(s) in combination with the other limitations the claimed "a height of between 0.0001-0.001 inches, a width from a top planar view between 0.0001-0.01 inches, and spacing between the lenses is between 0.001 to 0.01 inches."

11. Specifically, in reference to dependent claims 28-29, none of the prior art either alone or in combination disclose or teach of the claimed printed lens article specifically including, as the distinguishing feature(s) in combination with the other limitations the claimed "the printed lenses are arranged in parallel rows and the method further comprises adjusting orientation θ of the parallel rows to prevent flooding during printing of the lenses."

Conclusion

12. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Application/Control Number: 12/026,069
Art Unit: 2873

Page 9

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DAWAYNE A. PINKNEY whose telephone number is (571)270-1305. The examiner can normally be reached on Monday-Thurs. 8 a.m.- 4:30 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ricky Mack can be reached on (571) 272-2333. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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/Scott J. Sugarman/
Primary Examiner, Art Unit 2873

/DaWayne A Pinkney/
Examiner, Art Unit 2873
04/30/2009

95

Receipt date: 02/13/2009

Doc description: Information Disclosure Statement (IDS) Filed

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12026069 PTO/SB-08 (7-09)

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number	12026069
	Filing Date	2008-02-05
	First Named Inventor	Joel Scott Scarbrough
	Art Unit	2873
	Examiner Name	Dawayne Pinkney
	Attorney Docket Number	1094-00235

U.S.PATENTS

Examiner Initial*	Cite No	Patent Number	Kind Code ¹	Issue Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines where Relevant Passages or Relevant Figures Appear
/DP/	1	5712731	A	1998-01-27	Kenneth J. Drinkwater et al	
/DP/	2	6353500	B1	2002-03-05	Franck Gulgan et al	

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	Filing Date		2008-02-05	
	First Named Inventor	Joel Scott Scarbrough		
	Art Unit	2873		
	Examiner Name	Dawayne Pinkney		
	Attorney Docket Number	1094-00235		

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T ⁵
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Receipt date: 04/14/2009

12026069 - CAU-2873

Doc code: IDS

Doc description: Information Disclosure Statement (IDS) Filed

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number	12026069
	Filing Date	2008-02-05
	First Named Inventor	Joel Scott Scarbrough
	Art Unit	2873
	Examiner Name	Dawayna Pinkney
	Attorney Docket Number	1094-00235

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Examiner Initial*	Cite No	Patent Number	Kind Code ¹	Issue Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines where Relevant Passages or Relevant Figures Appear
/DP/	1	7075725	B2	2006-07-11	John Tomczyk	

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/DP/	1	20070058280	A1	2007-03-15	Richard A. Steenblik et al	
/DP/	2	20060262411	A1	2006-11-23	Douglas S. Dunn et al	

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Examiner Initial*	Cite No	Foreign Document Number ³	Country Code ²	Kind Code ⁴	Publication Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines where Relevant Passages or Relevant Figures Appear
/DP/	1	2006100412	AU	A4	2006-06-22	Serigraph, Inc.	

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Receipt date: 04/14/2009 INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		12026069	12026069 - GAU: 2873
	Filing Date		2008-02-05	
	First Named Inventor	Joel Scott Scarbrough		
	Art Unit	2873		
	Examiner Name	Dawayne Pinkney		
	Attorney Docket Number	1094-00235		

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T ⁵
/DP/	1	International Search Report for corresponding International Application No. PCT/US2009/033179, having a mailing date of April 3, 2009.	☐

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U.S.PATENTS								
Examiner Initial*	Cite No	Patent Number	Kind Code ¹	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear		
	1	7075725	B2	2006-07-11	John Tomczyk			
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Examiner Initial*	Cite No	Publication Number	Kind Code ¹	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear		
	1	20070058260	A1	2007-03-15	Richard A. Steenblik et al			
	2	20060262411	A1	2006-11-23	Douglas S. Dunn et al			
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Examiner Initial*	Cite No	Foreign Document Number ³	Country Code ²ⁱ	Kind Code ⁴	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T ⁵
	1	2006100412	AU	A4	2006-06-22	Serigraph, Inc.		☐
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		12026069
	Filing Date		2008-02-05
	First Named Inventor	Joel Scott Scarbrough	
	Art Unit	2873	
	Examiner Name	Dawayne Pinkney	
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Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T ⁵
	1	International Search Report for corresponding International Application No. PCT/US2009/033179, having a mailing date of April 3, 2009.	☐

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	First Named Inventor	Joel Scott Scarbrough	
	Art Unit		2873
	Examiner Name	Dawayne Pinkney	
	Attorney Docket Number		1094-00235

CERTIFICATION STATEMENT			
Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):			
☒ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).			
OR			
☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).			
☐ See attached certification statement.			
☐ Fee set forth in 37 CFR 1.17 (p) has been submitted herewith.			
☐ None			
SIGNATURE			
A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.			
Signature	/m scott mcbride/	Date (YYYY-MM-DD)	2009-04-14
Name/Print	M. Scott McBride, Ph.D.	Registration Number	52,008
This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.			

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(19) AUSTRALIAN PATENT OFFICE		(11) Application No. AU 2006100412 A4	
(54)	Title A printed article		
(51) ⁶	International Patent Classification(s) B42D 15/02 (2006.01) 4BHAU G09F G09F 7/00 (2006.01) 7/00 B42D 15/02 20060101AL/2006053 20060101AFI/2006052 0BHAU		
(21)	Application No:	2006100412	(22) Application Date: 2006.05.18
(43)	Publication Date :	2006.06.22	
(43)	Publication Journal Date :	2006.06.22	
(71)	Applicant(s) Serigraph, Inc.		
(72)	Inventor(s) LaSorsa, Louis; Faul, Daniel C.; Scarbrough, Joel Scott 20060622		
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103

2006100412 18 May 2006

A PRINTED ARTICLE

Abstract

A printed article (10) comprising a substrate (12) having a top surface (14); a graphic image (20) formed over the top surface (14) of the substrate (12); and a textured pattern of parallel lines (22) printed in sections over the graphic image (20). The angle or angles (40) of the parallel lines (22) relative to the shear direction (44) of ink applied to the article (10) are selected to prevent ink bleeding from the parallel lines (22).

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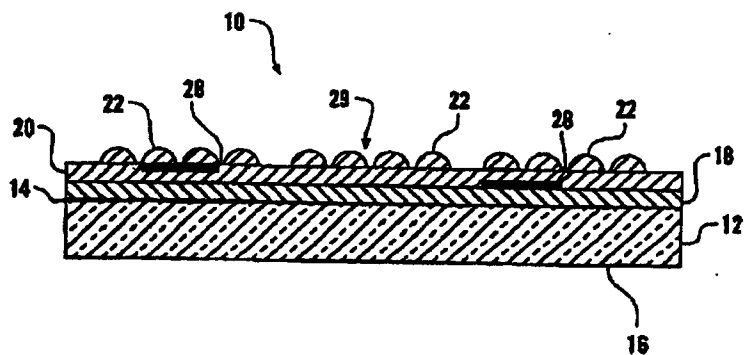


FIG. 1

2006100412 18 May 2006

S&F Ref: 765969

AUSTRALIA
PATENTS ACT 1990

INNOVATION PATENT SPECIFICATION

Name and Address
of Applicant : Serigraph, Inc.,
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Decorah Road, West Bend, Wisconsin, 53090,
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Actual Inventor(s): Joel Scott Scarbrough
Daniel C. Faul
Louis LaSorsa

Address for Service: Spruson & Ferguson
St Martins Tower Level 35
31 Market Street
Sydney NSW 2000
(CCN 3710000177)

Invention Title: A printed article

The following statement is a full description of this invention, including the best method of performing it known to me/us:-

5843c

A printed article

Field of the invention

- The present invention relates generally to a printed article, and more particularly to a printed article having a graphic design such as a trading card, greeting card, sign, poster, label, decal, book cover, decorative panel, name plate, visual display and the like having an image with a textured pattern printed thereon creating visual illusions of depth, three-dimensionality, hidden images and motion in the printed article.

Background of the invention

- In order to attract the attention of consumers, many products are being manufactured with images that provide a unique and sensational visual presentation. To meet this demand, a variety of printing techniques have been developed to produce aesthetically pleasing visual effects, such as the appearance of depth, three-dimensionality and motion. Various methods are known in the prior art that produce three-dimensional images on two-dimensional media.
- One method involves printing two offset images in different colours on an opaque or transparent sheet, and viewing the images using special glasses having right and left lenses which correspond to the different image colours respectively. Holographic technology can also be used to produce an image on a flat sheet which appears three-dimensional when illuminated and viewed at the proper angles.
- However, these methods have not been commercially popular for various reasons. The offset image method is undesirable in that special glasses are required to view the image.
- Holographic images or holograms are difficult and expensive to produce. Therefore, processes have been developed to produce the illusion of three-dimensional images on two-dimensional media. One such process is conventional embossing, which forms a raised pattern on a substrate by physically deforming part of the substrate upwardly. However, embossing suffers from the drawback that an expensive press is necessary to perform the operation, and a die bearing the desired embossed pattern must be made

for each application. Further, the materials that can be used for embossing are limited because of the deforming nature of the embossing process.

Therefore, a need exists for a printing method and printed article that offers the visual impact of embossing without the cost. WO 02/076759 provides a method of printing an article with a textured pattern of transparent ink over a graphic image. While this method proved effective, it was not without its limitations.

The transparent ink used to form the textured pattern has rheological properties such that when it is applied, it flows into a semi-cylindrical or other convex shape when viewed in cross-section. These convex shape lines produce a desirable reflective textured pattern on the surface of the printed article. However, the prevention of undesirable bleeding or flooding of the ink outside of the lines has limited the height, thickness, gap between lines and/or application speed of the textured pattern. The present invention overcomes at least some of the abovementioned problems in providing an improved printing method for printing images on a printed article having the illusion of depth.

Reference to any prior art in the specification is not, and should not be taken as, an acknowledgement or any form of suggestion that this prior art forms part of the common general knowledge in Australia or any other jurisdiction or that this prior art could reasonably be expected to be ascertained, understood and regarded as relevant by a person skilled in the art.

Summary of the invention

In one embodiment of the present invention there is provided a printed article including a substrate having a top surface; a graphic image formed over the top surface of the substrate; and a textured pattern of parallel lines printed in sections over the graphic image, wherein the angle or angles of the parallel lines relative to the shear direction of ink applied to the article are selected to prevent ink bleeding from the parallel lines.

The selection of the angles of the parallel lines to avoid bleeding of the parallel lines ensures that the printed article has a sharp clear image. By controlling the angles of the parallel lines, the height and/or thickness of the lines can be increased without bleeding

occurring. In addition, for the same comparative line height/thickness, the distance between the parallel lines may also be decreased without the risk of ink from adjacent lines bleeding or flooding into each other.

5 Preferably the textured pattern includes a plurality of parallel lines printed in sections, with each line in each section printed at the same angle and the lines of adjacent sections printed at different angles, such that the lines in each section reflect light in different directions.

10 The graphic image may include a plurality of ink layers having at least one hidden image lightly printed among the ink layers. These hidden or latent images are "weak" or "lightly" printed images that are printed among the plurality of ink layers of the graphic design, and are visible only at certain viewing angles. The hidden images appear and disappear from a viewer as the viewing angle of the printed article is changed. The "noise" of the reflected light from the texture "hides" the image, and a viewing angle that does not scatter the reflected light allows the viewer to see through the texture to see
15 the hidden image.

In another embodiment of the present invention, there is provided a method of forming a reflective printed article, the method including the steps of providing a substrate having a top surface; forming a graphic image over the top surface; and forming a textured pattern of parallel lines printed in sections over the graphic image, wherein the angle or
20 angles of the parallel lines relative to the shear direction of ink being applied to the article are selected to prevent ink bleeding from the parallel lines.

Preferably, the selection of the parallel line angle or angles is determined by running a test pattern to determine the parallel line angles which prevent ink from bleeding from the parallel lines. A series of tests at increasing ink heights may be applied during
25 these test runs to more readily determine what line heights can be achieved at particular angles. Similarly, testing can be directed to angles which achieved desired line thickness, separation/gap or printing speed requirements.

Brief description of the drawings

FIG.1 is an enlarged cross-sectional view of one embodiment of a printed article produced in accordance with the present invention;

FIG. 2 is a top plan view of a trading card having a textured pattern with differing parallel angles in accordance with the present invention.

Detailed description of the embodiments

Referring now to the drawings, FIG.1 illustrates a cross sectional view of a first embodiment of a printed article produced in accordance with the present invention, depicted on a much enlarged basis over actual size. The printed article 10 includes a substrate 12 having a top surface 14 and a bottom surface 16. The substrate 12 can be formed of paper, cardboard, plastic, acrylic, glass, metal or any other suitable printable material.

A layer 18 is preferably printed with a reflective ink over all or a portion of the top surface 14 of the substrate 12. While, a reflective layer is preferred, it will be appreciated that the increased thickness of the textured effect in the present invention enables great visual effects to be achieved on even plain paper substrates. The layer 18 can be clear or have any colour. The layer 18 can be opaque, transparent, semi-transparent or translucent. The layer 18 preferably gives the printed article a shiny or glossy metallic appearance. Alternatively, the reflective layer 18 can be formed of a chrome film, diffraction film, metallic foil, holographic foil, roll leafing, or any metalized material having a shiny surface.

A graphic design or image 20 is printed over all or a portion of the layer 18.

The image 20 can have any desired form, for example, a football player on a sports trading card as shown in FIG. 2, or any other image. The graphic design or image 20 may comprise a plurality of ink layers in order to provide the desired design. The graphic design 20 may also include hidden or latent images 28 printed within the design. These hidden or latent images 28 are "weak" or "lightly" printed images that are

printed among the plurality of ink layers of the graphic design, and are visible only at certain viewing angles. The hidden images 28 appear and disappear from a viewer as the viewing angle of the printed article is changed.

- 5 A preferred method of forming the graphic design 20 and hidden images 28 is through a four-color offset printing process where a base layer is printed and a four-color image is printed over the base layer. The graphic design 20 and hidden images 28 may be printed with opaque ink, semi-transparent ink, translucent ink, or any combination thereof. These inks are preferably curable in response to ultraviolet (UV) light. Other
- 10 methods of forming the graphic design 20 and hidden images 28 images include silk screening, lithography, flexography, gravure or other known printing methods. A textured pattern 29 is printed over and/or around the graphic design or image 20. The textured pattern includes a plurality of parallel convex rounded ridges or lines 22 of transparent ink printed in bands, rays or sections 60, FIG.2, over and/or around the
- 15 graphic design or image 20. The textured pattern 29 is created by a plurality of very thin lines 22 spaced very closely together at various angles and orientations to reflect light in various directions. In the preferred embodiment, the height and spacing between the lines is approximately 0.005 to 0.010 and approximately 0.005 – 0.020 inches respectively. Line heights of up to 0.008 inches or greater may be achieved if optimum
- 20 line angles are used. However, the thickness, height and spacing of the lines may vary depending upon the particular application and desired visual effect. The textured pattern 29 can be formed over the entire surface of the image 20 or over only a portion thereof. The textured pattern 29 of lines 22 is formed from a transparent ink suitable for use in this
- 25 application, printed on top of the graphic design or image 20 by a printing method such as silk screening, lithography, flexography, offset printing, gravure, coating or other known printing method. This transparent ink is preferably a UV curable ink. The transparent ink may also include flakes of glitter, or pearls, or other materials to produce a "glittery" effect on the printed article.
- 30 The transparent ink has rheological properties such that when it is applied, it flows into a semi-cylindrical or other convex shape when viewed in cross-section. These convex

shape lines produce a desirable reflective textured pattern on the surface of the printed article. However, bleeding or flooding of the ink outside of the lines has limited the height, thickness, line gap and/or application speed of the textured pattern. The present invention overcomes at least some of the abovementioned problems in providing an improved printing method for printing images on a printed article having the illusion of depth.

As illustrated in Figure 2, the angles $40 (\theta_1)$, $42 (\theta_2)$ of the parallel lines 22 relative to the shear direction 44 of ink being applied to the article are selected to prevent ink bleeding from the parallel lines. The force applied to the ink by the printing method applies a shear to the ink which causes the ink to flow. Depending upon the size of the shear the ink may flow outside of the applications lines, causing "bleeding" or "flooding" of ink. By controlling the relative angle between the shear direction of the ink and the angle of the parallel lines, bleeding can be minimised. It will be appreciated that a number of variables will contribute towards the likelihood of bleeding from the parallel lines, including the viscosity of the ink, the speed of the ink application (i.e. size of the shear force) and the surface energy of the ink and substrate surface. Consequently, the optimum angles may need to be redetermined if operating conditions change.

Substrates such as Polyethylene and polypropylene are examples of low energy surfaces. The forces between the hydrocarbon molecules that make up the polymers are weak and consequently polar liquids tend to form droplets on the surface rather than spread out.

It is difficult to coat low energy surfaces but fortunately there are numerous ways of converting low energy into high energy surfaces. All the methods aim to form oxygen containing species at the surface and this oxidation can be achieved by exposure to ultraviolet radiation, plasma or corona discharge or by flame or acid treatment.

Surface energy is quantified in terms of the forces acting on a unit length at the solid-liquid interface. The shear force from the application of the ink to the substrate surface effectively increases the surface energy in the direction of the shear, thus promoting the ink to spread out further in this direction than if no shear force was applied to the ink.

The ink/coating may be applied through silk screening, lithography, flexography and other known printing techniques. In the case of silk screening, as the squeegee moves forward it begins to apply force to the ink rather than to the screen. The force applied to the ink by the squeegee blade is called shear, a term that can be applied to any force that causes ink to flow. As the squeegee moves across the screen, it sweeps a wave of ink before it. The force generated within this wave pushes ink through the mesh and down onto the substrate. If the force generated is great enough, microscopic turbulence and surface tension result in bleeding of ink outside the intended contact area. Similar mechanisms apply for other printing techniques.

- 10 The textured pattern 29 gives the appearance of a raised or embossed effect, which simulates depth and three-dimensionality. The semi-cylindrically shaped raised ridges or lines 22 bend and reflect light incident on the printed article 10 producing the visual illusion of depth, three-dimensionality, hidden images and motion through hue and color changes in the printed article as it is viewed from different angles. Light incident on the
- 15 printed article 10 is reflected off the reflective layer 18 back through the graphic design or image 20 and the textured pattern 29 to create a unique visual effect. As mentioned previously, the textured pattern 29 includes a plurality of parallel lines 22 printed in bands, rays or sections 60 over the image 20. The parallel lines 22 in each section 60 are all oriented in the same direction to illuminate the entire section of printed lines
- 20 when light is reflected from the reflective layer 18 through the textured pattern of lines. Adjacent sections 60 have parallel lines 22 oriented in different directions to reflect light in different directions as the printed article 10 is viewed from different angles. These different sections 60 of textured patterns of lines create the illusion of depth, three-dimensionality, appearing and disappearing images, and motion in the printed article 10
- 25 as it is viewed from different angles.

It will be understood that the invention disclosed and defined in this specification extends to all alternative combinations of two or more of the individual features mentioned or evident from the text or drawings. All of these different combinations constitute various alternative aspects of the invention.

The claims defining the invention are as follows;

- 1 A printed article including a substrate having a top surface; a graphic image formed over the top surface of the substrate; and a textured pattern of parallel lines printed in sections over the graphic image, wherein the angle or angles of the parallel
- 5 lines relative to the shear direction of ink applied to the article are selected to prevent ink bleeding from the parallel lines.
- 2 The printed article of claim 1 wherein the textured pattern includes a plurality of parallel lines printed in sections, with each line in each section printed at the same angle and the lines of adjacent sections printed at different angles, such that the lines in
- 10 each section reflect light in different directions.
- 3 The printed article of claim 1 or 2 wherein the graphic image includes a plurality of ink layers having at least one hidden image lightly printed among the ink layers.
- 4 A method of forming a printed article, the method including the steps of providing a substrate having a top surface; forming a graphic image over the top surface; and
- 15 forming a textured pattern of parallel lines printed in sections over the graphic image, wherein the angle or angles of the parallel lines relative to the shear direction of ink being applied to the article are selected to prevent ink bleeding from the parallel lines.
- 5 The method of forming a printed article of claim 4 wherein the selection of the parallel line angle or angles is determined by running a test pattern to determine the
- 20 parallel line angles which prevent ink from bleeding from the parallel lines.

Dated 18 May, 2006

Serigraph, Inc

Patent Attorneys for the Applicant/Nominated Person

SPRUSON & FERGUSON

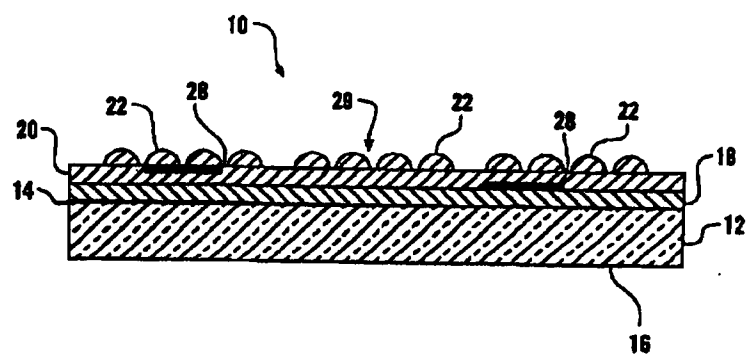


FIG. 1



PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference 1094-00251	FOR FURTHER ACTION see Form PCT/ISA/220 as well as, where applicable, item 5 below.
International application No. PCT/US2009/033179	International filing date (day/month/year) 05 February 2009 (Earliest) Priority Date (day/month/year) 05 February 2008
Applicant SERIGRAPH INC.	

This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 3 sheets.

☐ It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

a. With regard to the language, the international search was carried out on the basis of:

- ☒ the international application in the language in which it was filed
- ☐ a translation of the international application into _____, which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b))

b. ☐ With regard to any nucleotide and/or amino acid sequence disclosed in the international application, see Box No. I.

2. ☒ Certain claims were found unsearchable (see Box No. II)

3. ☐ Unity of invention is lacking (see Box No. III)

4. With regard to the title,

- ☒ the text is approved as submitted by the applicant
- ☐ the text has been established by this Authority to read as follows:

5. With regard to the abstract,

- ☒ the text is approved as submitted by the applicant
- ☐ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority

6. With regard to the drawings,

- a. the figure of the drawings to be published with the abstract is Figure No. 6
- ☐ as suggested by the applicant
- ☒ as selected by this Authority, because the applicant failed to suggest a figure
- ☐ as selected by this Authority, because this figure better characterizes the invention
- b. ☐ none of the figures is to be published with the abstract

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US2009/033179

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
3. ☒ Claims Nos.: 4-17
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying additional fees, this Authority did not invite payment of additional fees.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- ☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- ☐ No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2009/033179

A. CLASSIFICATION OF SUBJECT MATTER IPC(8) - G02B 27/10 (2009.01) USPC - 359/619 According to International Patent Classification (IPC) or to both national classification and IPC												
B. FIELDS SEARCHED Minimum documentation searched (classification system followed by classification symbols) IPC(8) - G02B 27/10 (2009.01) USPC - 359/618, 619, 620, 625-628; 283/72 Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) USPTO EAST System (US, USPG-PUB, EPO, DERWENT)												
C. DOCUMENTS CONSIDERED TO BE RELEVANT												
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.										
X	US 2007/0058260 A1 (STEENBLIK et al) 15 March 2007 (15.03.2007) entire document	18, 25, 27										
Y		1-3, 19-24, 26										
Y	US 7,075,725 B2 (TOMCZYK) 11 July 2006 (11.07.2006) entire document	1-3, 19-24, 26										
Y	US 2006/0262411 A1 (DUNN et al) 23 November 2006 (23.11.2006) entire document	19, 21										
Y	AU 2006100412 A4 (LASORSA et al) 22 June 2006 (22.06.2006) entire document	23, 26										
☐ Further documents are listed in the continuation of Box C. ☐												
* Special categories of cited documents: <table border="0"><tr><td>"A" document defining the general state of the art which is not considered to be of particular relevance</td><td>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</td></tr><tr><td>"E" earlier application or patent but published on or after the international filing date</td><td>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone</td></tr><tr><td>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</td><td>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art</td></tr><tr><td>"O" document referring to an oral disclosure, use, exhibition or other means</td><td>"&" document member of the same patent family</td></tr><tr><td>"P" document published prior to the international filing date but later than the priority date claimed</td><td></td></tr></table>			"A" document defining the general state of the art which is not considered to be of particular relevance	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention	"E" earlier application or patent but published on or after the international filing date	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone	"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art	"O" document referring to an oral disclosure, use, exhibition or other means	"&" document member of the same patent family	"P" document published prior to the international filing date but later than the priority date claimed	
"A" document defining the general state of the art which is not considered to be of particular relevance	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention											
"E" earlier application or patent but published on or after the international filing date	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone											
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art											
"O" document referring to an oral disclosure, use, exhibition or other means	"&" document member of the same patent family											
"P" document published prior to the international filing date but later than the priority date claimed												
Date of the actual completion of the international search 17 March 2009		Date of mailing of the international search report 03 APR 2009										
Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US, Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-3201		Authorized officer: Blaine R. Copenheaver PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774										

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application No.	: 12/026,069	)	CERTIFICATION OF ELECTRONIC
		)	SUBMISSION
Applicant	: Joel Scott Scarbrough	)	
Filed	: February 5, 2008	)	I hereby certify that this correspondence is
		)	being submitted electronically with the
Title	: Printed Article for	)	United States Patent and Trademark Office's
	Displaying Images Having	)	electronic filing system (EFS Web) on this
	Improved Definition and	)	13th day of February, 2009.
	Depth	)	
TC/A.U.	: 2873	)	
Examiner	: Dawayne Pinkney	)	<u>Aleshia Prange</u> February 13, 2009
		)	Aleshia Prange Date
Docket No.	: 1094-00235	)	
Customer No.	: 26753	)	
Confirmation No.	: 2422	)	

AMENDMENT UNDER 37 C.F.R. 1.111

Mail Stop: Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

This document is responsive to the Office Action mailed August 19, 2008 and includes a request for a three-month extension for reply.

Please amend the application as set forth below.

Amendments to the Claims appear in the list of claims beginning on page 2 of this document.

Remarks begin on page 6 of this document.

Amendments to the Claims:

The following list of claims will replace all prior lists of claims in the application.

List of Claims:

1. (Original) A printed article comprising:
 - (a) a substrate having a top surface and a bottom surface;
 - (b) a graphic image layer comprising a plurality of images printed on at least one surface of the substrate; and
 - (c) a plurality of polygonal lenses printed on at least one surface of the substrate above the graphic image layer, wherein the polygonal lenses are clear, magnifying, convex lenses.
2. (Original) The printed article of claim 1, wherein the plurality of polygonal lenses comprises polygonal lenses selected from the group consisting of hexagon lenses, square lenses, rectangle lenses, and rhombus lenses.
3. (Original) The printed article of claim 2, wherein the polygonal lenses comprise hexagon lenses.
4. (Original) The printed article of claim 1, wherein the polygonal lenses are semi-circular in cross-section.
5. (Original) The printed article of claim 1, wherein the polygonal lenses are substantially flat in cross-section.
6. (Original) The printed article of claim 1, wherein the plurality of images comprises a micro-pattern image.

7. (Original) The printed article of claim 1, wherein the plurality of polygonal lenses are oriented above the plurality of images such that each lens magnifies a portion of an image to display at least one composite image.

8. (Original) The printed article of claim 1, wherein the plurality of lenses are individually printed on the substrate.

9. (Original) The printed article of claim 1, wherein the plurality of images comprises an array of images and the plurality of lenses comprises an array of lenses.

10. (Original) The printed article of claim 9, wherein:
the array of lenses has a frequency of lenses;
the array of images has a frequency of images; and
the frequency of lenses is greater than the frequency of images.

11. (Original) The printed article of claim 9, wherein:
the array of lenses has a frequency of lenses;
the array of images has a frequency of images; and
the frequency of lenses is less than the frequency of images.

12. (Original) The printed article of claim 9, wherein:
the array of lenses has a frequency of lenses;
the array of images has a frequency of images; and
the frequency of lenses is the same as the frequency of images.

13. (Original) The printed article of claim 9, wherein the array of images comprises a micro-pattern image.

14. (Original) The printed article of claim 1, further comprising:
(d) a second graphic image layer printed on at least one surface of the substrate.

15. (Original) The printed article of claim 1, wherein the substrate is transparent.

16. (Original) The printed article of claim 15, wherein the graphic image layer is printed on the bottom surface of the substrate.

17. (Original) A printed article comprising:

- (a) a substrate having a top surface and a bottom surface;
- (b) a graphic image layer comprising a plurality of images printed on at least one surface of the substrate;
- (c) a transparent layer formed on at least one surface of the substrate above the graphic image layer; and
- (d) a plurality of polygonal lenses formed on the transparent layer above the graphic image layer, wherein the polygonal lenses are clear, magnifying, convex lenses.

18. (Original) A printed article comprising:

- (a) a transparent substrate having a top surface and a bottom surface;
- (b) a graphic image layer comprising a plurality of images printed on the bottom surface of the substrate; and
- (c) a plurality of polygonal lenses printed on the top surface of the substrate, wherein the polygonal lenses are clear, magnifying, convex lenses.

19. (Original) A method of forming a printed article, the method comprising:

- (a) printing a graphic image layer comprising a plurality of images on at least one surface of a substrate; and
- (b) printing a plurality of polygonal lenses on at least one surface of the substrate above the graphic image layer, wherein the polygonal lenses are clear, magnifying, convex lenses.

20. (Original) A printed article formed by the method of claim 19, wherein the polygonal lenses comprise hexagon lenses.

21. (Original) A method of forming a printed article, the method comprising:
- (a) printing a graphic image layer comprising a plurality of images on at least one surface of a substrate;
 - (b) coating the graphic image layer with a transparent layer; and
 - (c) forming a plurality of polygonal lenses on the transparent layer, wherein the polygonal lenses are clear, magnifying, convex lenses.
22. (Original) A printed article formed by the method of claim 21, wherein the polygonal lenses comprise hexagon lenses.
23. (New) The printed article of claim 1, wherein the printed lenses have a height of between 0.0001-0.001 inches, a width from a top planar view between 0.0001-0.01 inches, and spacing between the lenses is between 0.001 to 0.01 inches.
24. (New) The printed article of claim 17, wherein the printed lenses have a height of between 0.0001-0.001 inches, a width from a top planar view between 0.0001-0.01 inches, and spacing between the lenses is between 0.001 to 0.01 inches.
25. (New) The printed article of claim 18, wherein the printed lenses have a height of between 0.0001-0.001 inches, a width from a top planar view between 0.0001-0.01 inches, and spacing between the lenses is between 0.001 to 0.01 inches.
26. (New) The method of claim 19, wherein the printed lenses have a height of between 0.0001-0.001 inches, a width from a top planar view between 0.0001-0.01 inches, and spacing between the lenses is between 0.001 to 0.01 inches.
27. (New) The method of claim 21, wherein the printed lenses have a height of between 0.0001-0.001 inches, a width from a top planar view between 0.0001-0.01 inches, and spacing between the lenses is between 0.001 to 0.01 inches.

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Amendment Dated February 13, 2009
Reply to Office Action of August 19, 2008

28. (New) The method of claim 19, wherein the printed lenses are arranged in parallel rows and the method further comprises adjusting orientation θ of the parallel rows to prevent flooding during printing of the lenses.

29. (New) The method of claim 21, wherein the printed lenses are arranged in parallel rows and the method further comprises adjusting orientation θ of the parallel rows to prevent flooding during printing of the lenses.

REMARKS

Reconsideration of the application is requested in view of the foregoing amendments and for the following remarks.

I. Claim Amendments

Prior to this amendment, claims 1-22 were pending. Claims 23-29 are requested to be added.

New claims 23-27 recite "wherein the printed lenses have a height of between 0.0001-0.001 inches, a width from a top planar view between 0.0001-0.01 inches, and spacing between the lenses is between 0.001 to 0.01 inches." Support for this limitation is provided in the original Specification, for example, at page 21, line 26 to page 22, line 6 (paragraph [0083]).

New claims 28 and 29 recite "wherein the printed lenses are arranged in parallel rows and the method further comprises adjusting orientation θ of the parallel rows to prevent flooding during printing of the lenses." Support for this limitation is provided in the original Specification, for example, at page 22, line 22 to page 23, line 5 (paragraph [0086]) and in Figure 5.

Because the claim amendments do not introduce new matter and otherwise are proper, entry thereof is requested. After entering the amendments, claims 1-29 are pending in the application.

II. Information Disclosure Statement

The Applicant submits herewith an Information Disclosure Statement. The Examiner is asked to consider and make of record the listed references.

III. Claim Rejections – 35 U.S.C. 102(b) (Steenblik *et al.*)

Claims 1-4 and 6-22 were rejected under 35 U.S.C. 102(b) as being allegedly anticipated by Steenblik *et al.* (U.S. Published Application No. 2005/0180020)(hereinafter "Steenblik *et al.*"). The

Applicant respectfully traverses the rejection in view of the foregoing amendment and for the following reasons.

The Office Action contends that “Steenblik *et al.* discloses a printed article comprising:...(c) a plurality of polygonal lenses printed on at least one surface of the substrate above the graphic image layer, wherein the polygonal lenses are clear, magnifying, convex lenses (1 of Figs. 1a-1b, and 3a-3i).” (See Office Action, page 2 (emphasis added)). The Examiner respectfully is asked to reconsider the assertion that Steenblik *et al.* disclose printed lenses as presently claimed.

Steenblik *et al.* utilize a lens material referred to as “Unison”:

[0012] There are a number of distinct visual effects that can be provided by the present material (subsequently referred to as “Unison” for the material in general, or by the names “Unison Motion”, “Unison Deep”, “Unison Super-Deep”, “Unison Float”, “Unison SuperFloat”, “Unison Levitate”, “Unison Morph”, and “Unison 3-D” for Unison material presenting those respective effects), and their various embodiments producing each of these effects, generally described as follows:

[0013] Unison Motion presents images that show ortho-parallactic movement (OPM)—when the material is tilted the images move in a direction of tilt that appears to be perpendicular to the direction anticipated by normal parallax. Unison Deep and SuperDeep present images that appear to rest on a spatial plane that is visually deeper than the thickness of the material. Unison Float and SuperFloat present images that appear to rest on a spatial plane that is a distance above the surface of the material; and Unison Levitate presents images that oscillate from Unison Deep (or SuperDeep) to Unison Float (or SuperFloat) as the material is rotated through a given angle (e.g. 90 degrees), then returning to Unison Deep (or SuperDeep) again as the material is further rotated by the same amount. Unison Morph presents synthetic images that change form, shape, or size as the material is rotated or viewed from different viewpoints. Unison 3-D presents images that show large scale three-dimensional structure, such as an image of a face.

(See Steenblik *et al.*, paragraphs [0012] and [0013]). Unisom material may be prepared by a number of methods, none of which include printing:

[0216] Unison materials can be manufactured by sheet or web processing utilizing tools that separately incorporate the lens and icon microstructures. Both the lens tools and the icon tools are originated using photomasks and photoresist methods.

[0219] Unison materials can be manufactured from a variety of materials and a multiplicity of methods that are known in the art of micro-optic and microstructure replication, including extrusion embossing, radiation cured casting, soft embossing, and injection molding, reaction injection molding, and reaction casting. An exemplary method of manufacture is to form the icons as voids in a radiation cured

liquid polymer that is cast against a base film, such as 75 gage adhesion-promoted PET film, then to form the lenses from radiation cured polymer on the opposite face of the base film in correct alignment or skew with respect to the icons, then to fill the icon voids with a submicron particle pigmented coloring material by gravure-like doctor blading against the film surface, solidify the fill by suitable means (ex: solvent removal, radiation curing, or chemical reaction), and finally apply an optional sealing layer that may be either clear, dyed, pigmented, or incorporate covert security materials.

(See Steenblik *et al.*, paragraphs [0216] and [0219]). The lenses of Unisom material are not printed lenses as presently claimed, nor do Steenblik *et al.* disclose methods for making printed lenses as presently claimed.

Furthermore, Steenblik *et al.* teach away from printed lenses as presently claimed. Printed lenses are formed by applying a liquid lens material to a surface of a substrate. As such, the dimensions of printed lenses are limited by a number of factors include viscosity and surface tension of the printed liquid lens material. The dimensions of printed lenses with respect to width and height resemble a "Drinkwater lens" as discussed by Steenblik *et al.*:

[0103] Lenses having a low F# are particularly suitable for use in the present system. By low F# we mean less than 4, and in particular for Unison Motion approximately 2 or lower. Low F# lenses have high curvature and a correspondingly large sag, or center thickness, as a proportion of their diameter. A typical Unison lens, with an F# of 0.8, has a hexagonal base 28 microns wide and a center thickness of 10.9 microns. A typical Drinkwater lens, with a diameter of 50 microns and a focal length of 200 microns, has an F# of 4 and a center thickness of 3.1 microns. If scaled to the same base size, the Unison lens has a sag almost six times larger than the Drinkwater lens.

(See Steenblik *et al.*, paragraph [0103]). Steenblik *et al.* distinguish a typical Unison lens from a Drinkwater lens stating that “the Unison lens has a sag almost six time larger than the Drinkwater lens.” (See *id.* (emphasis added)) Because a printed lens will have dimensions resembling those of a Drinkwater lens, Steenblik *et al.* teach away from printed lenses. Unison lenses are prepared by non-printing methods suitable for obtaining a larger “sag.”

For all these reasons, claims 1-4 and 6-22 are patentable over Steenblik *et al.* and the rejection should be reconsidered and withdrawn.

IV. Claim Rejections – 35 U.S.C. 103(a) (Steenblik *et al.*)

Claim 5 is rejected as being allegedly unpatentable over Steenblik *et al.* under 35 U.S.C. 103(a). The Applicant respectfully traverses the rejection and asks that the Examiner review paragraph [0103] of Steenblik *et al.* and reconsider the rejection.

Claim 5 recites “wherein the polygonal lenses are substantially flat in cross-section.” In contrast, Steenblik *et al.*’s Unison lenses have a low F#, and Steenblik *et al.* state, “Low F# lenses have high curvature and a corresponding large sag or center thickness, as a proportion of their diameter.” (See Steenblik *et al.*, paragraph [0103] (emphasis added)). Because Steenblik *et al.*’s lenses have a

high curvature and a corresponding large sag or center thickness, Steenblik *et al.* teach away from printed lenses that are substantially flat in cross-section (*i.e.*, lenses having relatively low “sag”).

Furthermore, the Applicant has observed that flat surface lenses may be utilized to create hidden images. This is an unexpected result. Steenblik *et al.* do not teach or suggest that flat surface lenses can be used to create hidden images. In fact, the Applicant is unaware of any prior art reference in which flat surface lenses are contemplated for any purpose, let alone to create hidden images.

For all these reasons, claim 5 is patentable over Steenblik *et al.* and the rejection should be reconsidered and withdrawn.

V. New Claims 23-29

New claims 23-29, likewise, are patentable over Steenblik *et al.* New claims 23-27 recite printed lenses having specific dimensions and spacing. Steenblik *et al.* do not disclose printed lenses having the specific dimensions and spacing nor do Steenblik *et al.* disclose methods for printing lenses having the specific dimensions and spacing without flooding. New claims 28 and 29 recite an additional step for the methods of claims 19 and 21, respectively, “wherein the printed lenses are arranged in parallel rows and the method further comprises adjusting orientation θ of the parallel rows to prevent flooding during printing of the lenses.” Steenblik *et al.* do not teach or suggest methods for printing lenses let alone adjusting orientation θ of the parallel rows of printed lenses to prevent flooding during printing.

For all these reasons, claims 23-29 are patentable over Steenblik *et al.*

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Amendment Dated February 13, 2009
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VI. Conclusion

It is believed that this application is in condition for allowance and such action is earnestly requested.

Respectfully submitted,

ANDRUS, SCEALES, STARKE & SAWALL, LLP



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Reg. No. 52,008
Customer No. 26753

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Telephone: (414) 271-7590
Facsimile: (414) 271-5770

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		12026069	
	Filing Date		2008-02-05	
	First Named Inventor	Joel Scott Scarbrough		
	Art Unit	2873		
	Examiner Name	Dawayne Pinkney		
	Attorney Docket Number	1094-00235		

U.S.PATENTS								
Examiner Initial*	Cite No	Patent Number	Kind Code ¹	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear		
	1	5712731	A	1998-01-27	Kenneth J. Drinkwater et al			
	2	6353500	B1	2002-03-05	Franck Guigan et al			
If you wish to add additional U.S. Patent citation information please click the Add button.								
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Examiner Initial*	Cite No	Publication Number	Kind Code ¹	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear		
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**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**
 (Not for submission under 37 CFR 1.99)

Application Number		12026069
Filing Date		2008-02-05
First Named Inventor	Joel Scott Scarbrough	
Art Unit	2873	
Examiner Name	Dawayne Pinkney	
Attorney Docket Number	1094-00235	

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T ⁵
	1		☐

If you wish to add additional non-patent literature document citation information please click the Add button

EXAMINER SIGNATURE			
Examiner Signature		Date Considered	
*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.			
¹ See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. ² Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). ³ For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. ⁴ Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. ⁵ Applicant is to place a check mark here if English language translation is attached.			

**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**
(Not for submission under 37 CFR 1.99)

Application Number	12026069
Filing Date	2008-02-05
First Named Inventor	Joel Scott Scarbrough
Art Unit	2873
Examiner Name	Dawayne Pinkney
Attorney Docket Number	1094-00235

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

- ☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).
- OR**
- ☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).
- ☐ See attached certification statement.
- ☒ Fee set forth in 37 CFR 1.17 (p) has been submitted herewith.
- ☐ None

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/m scott mcbride/	Date (YYYY-MM-DD)	2009-02-13
Name/Print	M. Scott McBride, Ph.D.	Registration Number	52,008

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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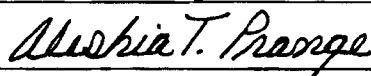
RESCISSION OF PREVIOUS NONPUBLICATION REQUEST (35 U.S.C. 122(b)(2)(B)(ii)) AND, IF APPLICABLE, NOTICE OF FOREIGN FILING (35 U.S.C. 122(b)(2)(B)(iii)) Send completed form to: Mail Stop PG Pub Commissioner for Patents P.O. Box 1450 Alexandria, VA 22313-1450 FAX: (703) 305-8568		Application Number	12/026,069
		Filing Date	February 5, 2008
		First Named Inventor	Joel Scott Scarbrough
		Title	Printed Article for Displaying Images Having Improved Definition and Depth
		Atty. Docket Number	1094-00235
		Group Art Unit	2873
		Examiner	Dawayne Pinkney
		Confirmation No.	2422
		Customer No.	26753

A request that the above-identified application not be published under 35 U.S.C. 122(b) (non-publication request) was included with the above-identified application on filing pursuant to 35 U.S.C. 122(b)(2)(B)(i). I hereby **rescind** the previous nonpublication request.

If a notice of foreign or international filing is or will be required by 35 U.S.C. 122(b)(2)(B)(iii) and 37 CFR 1.213(c), I hereby provide such notice. This notice is being provided no later than forty-five (45) days after the date of such foreign or international filing.

February 13, 2009	
Date	Signature
(414) 271-7590	M. Scott McBride, Ph.D. (Reg. No. 52,008)
Telephone Number	Attorney for Applicant
	Typed or printed name

This request must be signed in compliance with 37 CFR 1.33(b).

CERTIFICATION OF ELECTRONIC SUBMISSION			
I hereby certify that this correspondence is being submitted electronically with the United States Patent and Trademark Office's electronic filing system (EFS Web) on this 13th day of February, 2009.			
Typed or printed name	Aleshia T. Prange		
Signature		Date	February 13, 2009



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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/026,069	02/05/2008	Joel Scott Scarbrough	1094-00235	2422
26753 7590 08/19/2008 ANDRUS, SCEALES, STARKE & SAWALL, LLP 100 EAST WISCONSIN AVENUE, SUITE 1100 MILWAUKEE, WI 53202				
			EXAMINER PINKNEY, DAWAYNE	
			ART UNIT 2873	PAPER NUMBER
			MAIL DATE 08/19/2008	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	12/026,069	SCARBROUGH, JOEL SCOTT	
	Examiner	Art Unit	
	DAWAYNE A. PINKNEY	2873	

– The MAILING DATE of this communication appears on the cover sheet with the correspondence address –

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
 - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
 - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 February 2008.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 03/17/2008 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) ☒ Notice of References Cited (PTO-892) | 4) ☐ Interview Summary (PTO-413) |
| 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) ☒ Information Disclosure Statement(s) (PTO/SB/08) | 5) ☐ Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>02/25/2008</u> | 6) ☐ Other: _____ |

DETAILED ACTION

Information Disclosure Statement

1. The information disclosure statement (IDS) submitted on 02/25/2008 has been considered by the examiner.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-4, and 6-22 are rejected under 35 U.S.C. 102(b) as being anticipated by Steenblik et al. (US 2005/0180020).

Regarding **claim 1**, Steenblik discloses, a printed article comprising:

(a) a substrate having a top surface and a bottom surface (5, 8 of Figs. 1a-1b);

(b) a graphic image layer comprising a plurality of images printed on at least one surface of the substrate (4 of Figs. 1a-1b); and

(c) a plurality of polygonal lenses printed on at least one surface of the substrate above the graphic image layer, wherein the polygonal lenses are clear, magnifying, convex lenses (1 of Figs. 1a-1b, and 3a-3i).

Regarding **claim 2**, Steenblik discloses, the printed article of claim 1, wherein the plurality of polygonal lenses comprises polygonal lenses selected from the group consisting of hexagon lenses, square lenses, rectangle lenses, and rhombus lenses (Figs. 3a-3i).

Regarding **claim 3**, Steenblik discloses, the printed article of claim 2, wherein the polygonal lenses comprise hexagon lenses (Figs. 3a-3i).

Regarding **claim 4**, Steenblik discloses, the printed article of claim 1, wherein the polygonal lenses are semi-circular in cross-section (1 of Figs. 1a-1b, and Figs. 3a-3i).

Regarding **claim 6**, Steenblik discloses, the printed article of claim 1, wherein the plurality of images comprises a micro-pattern image (4 of Figs. 1a-1b).

Regarding **claim 7**, Steenblik discloses, the printed article of claim 1, wherein the plurality of polygonal lenses are oriented above the plurality of images such that each lens magnifies a portion of an image to display at least one composite image (1 of Figs. 1a-1b).

Regarding **claim 8**, Steenblik discloses, the printed article of claim 1, wherein the plurality of lenses are individually printed on the substrate (1 of Figs. 1a-1b).

Regarding **claim 9**, Steenblik discloses, the primed article of claim 1, wherein the plurality of images comprises an array of images and the plurality of lenses comprises an array of lenses (1, 4 of Figs. 1a-1b).

Regarding **claim 10**, Steenblik discloses, the printed article of claim 9, wherein:

the array of lenses has a frequency of lenses (1 of Figs. 1a-1b);

the array of images has a frequency of images (4 of Figs. 1a-1b); and

the frequency of lenses is greater than the frequency of images (Paragraph 0079).

Regarding **claim 11**, Steenblik discloses, the primed article of claim 9, wherein:

the array of lenses has a frequency of lenses (1 of Figs. 1a-1b);

the array of images has a frequency of images (4 of Figs. 1a-1b); and

the frequency of lenses is less than the frequency of images (Paragraph 0079).

Regarding **claim 12**, Steenblik discloses, the printed article of claim 9, wherein:

the array of lenses has a frequency of lenses (1 of Figs. 1a-1b);

the array of images has a frequency of images (4 of Figs. 1a-1b); and

the frequency of lenses is the same as the frequency of images (Paragraph 0079).

Regarding **claim 13**, Steenblik discloses, the printed article of claim 9, wherein the array of images comprises a micro-pattern image (4 of Figs. 1a-1b).

Regarding **claim 14**, Steenblik discloses, the printed article of claim 1, further comprising:

(d) a second graphic image layer printed on at least one surface of the substrate (162, 164 of Fig. 10).

Regarding **claim 15**, Steenblik discloses, the printed article of claim 1, wherein the substrate is transparent (8 of Figs. 1a-1b).

Regarding **claim 16**, Steenblik discloses, the printed article of claim 15, wherein the graphic image layer is printed on the bottom surface of the substrate (4 of Figs. 1a-1b).

Regarding **claim 17**, Steenblik discloses, a printed article comprising:

(a) a substrate having a top surface and a bottom surface (8 of Figs. 1a-1b);

(b) a graphic image layer comprising a plurality of images printed on at least one surface of the substrate (4 of Figs. 1a-1b);

(c) a transparent layer formed on at least one surface of the substrate above the graphic image layer (5 of Figs. 1a-1b); and

(d) a plurality of polygonal lenses formed on the transparent layer above the graphic image layer, wherein the polygonal lenses are clear, magnifying, convex lenses (1 of Figs. 1a-1b).

Regarding **claim 18**, Steenblik discloses, a printed article comprising:

- (a) a transparent substrate having a top surface and a bottom surface (8 of Figs. 1a-1b);
- (b) a graphic image layer comprising a plurality of images printed on the bottom surface of the substrate (4 of Figs. 1a-1b); and
- (c) a plurality of polygonal lenses printed on the top surface of the substrate, wherein the polygonal lenses are clear, magnifying, convex lenses (1 of Figs. 1a-1b).

Regarding **claim 19**, Steenblik discloses, a method of forming a primed article, the method comprising:

- (a) printing a graphic image layer comprising a plurality of images on at least one surface of a substrate (4 of Figs. 1a-1b); and
- (b) priming a plurality of polygonal lenses on at least one surface of the substrate above the graphic image layer, wherein the polygonal lenses are clear, magnifying, convex lenses (1 of Figs. 1a-1b).

Regarding **claim 20**, Steenblik discloses, a primed article formed by the method of claim 19, wherein the polygonal lenses comprise hexagon lenses (Figs. 3a-3i).

Regarding **claim 21**, Steenblik discloses, a method of forming a printed article, the method comprising:

- (a) printing a graphic image layer comprising a plurality of images on at least one surface of a substrate (4 of Figs. 1a-1b);

(b) coating the graphic image layer with a transparent layer (5, 8 of Figs. 1a-1b); and
(c) forming a plurality of polygonal lenses on the transparent layer, wherein the polygonal lenses are clear, magnifying, convex lenses (1 of Figs. 1a-1b).

Regarding **claim 22**, Steenblik discloses, a primed article formed by the method of claim 21, wherein the polygonal lenses comprise hexagon lenses (Figs. 3a-3i).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Steenblik et al. (US 2005/0180020) as applied to claim 1 above.

Steenblik remains as applied to **claim 1** above.

Although Steenblik does not specifically disclose the polygonal lenses are substantially flat in cross-section, change in form of any element of prior patent must result in more than useful natural phenomenon that man has accumulated through common knowledge; even though use of new device greatly improves field and provides great utility, and commercial success is enjoyed because of long-felt need, these features cannot sustain patentability where involved is only extended application of obvious attributes from prior art. *Span Deck Inc. v. Fab-Con, Inc.* (CA 8, 1982) 215 USPQ 835. Furthermore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to make the polygonal lenses are substantially flat in cross-section for the purpose of providing a printed article which contains hidden images.

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Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DAWAYNE A. PINKNEY whose telephone number is (571)270-1305. The examiner can normally be reached on Monday-Thurs. 8 a.m.- 4:30 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ricky Mack can be reached on (571) 272-2333. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/DaWayne A Pinkney/
Examiner, Art Unit 2873
07/29/2008

/Ricky L. Mack/
Supervisory Patent Examiner, Art Unit 2873

Notice of References Cited	Application/Control No. 12/026,069	Applicant(s)/Patent Under Reexamination SCARBROUGH, JOEL SCOTT	
	Examiner DAWAYNE A. PINKNEY	Art Unit 2873	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-2005/0180020	08-2005	Steenblik et al.	359/626
	B	US-			
	C	US-			
	D	US-			
	E	US-			
	F	US-			
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

Receipt date: 02/25/2008

12026069 - GAU: 2873

PTO/SB/08A (04-03)

Approved for use through 4/30/2003. OMB 0651-0031)

U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE

Substitute for form 1449A/PTO INFORMATION DISCLOSURE STATEMENT BY APPLICANT (use as many sheets as necessary)	Complete if Known	
	Application Number	12/026,069
	Filing Date	02/05/2008
	First Named Inventor	Joel Scott Scarbrough
	Group Art Unit	~~2891~~ 2873
Sheet 1 of 2	Examiner Name	PINKNEY
	Attorney Docket number	1094-00235

U.S. PATENT DOCUMENTS					
Examiner Initials*	Cite No.	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number-Kind Code			
/DP/		US-4,588,899	05/13/1986	Erhardt	
		US-4,920,039	04/24/1990	Fotland et al.	
		US-5,276,478	01/04/1994	Morton	
		US-5,460,679	10/24/1995	Abdel-Kader	
		US-5,642,226	06/24/1997	Rosenthal	
		US-5,644,431	07/01/1997	Magee	
		US-5,680,734	10/28/1997	Magee	
		US-5,699,190	12/18/1997	Young et al.	
		US-5,753,344	05/19/1998	Jacobsen	
		US-5,800,907	09/01/1998	Yumoto	
		US-5,933,084	08/03/1999	Ravier et al.	
		US-6,043,481	03/28/2000	Tan et al.	
		US-6,084,713	07/04/2000	Rosenthal	
		US-6,091,479	07/18/2000	Frosig et al.	
		US-6,101,039	08/08/2000	Blazey	
		US-6,110,652	08/29/2000	Stork et al.	
		US-6,113,149	09/05/2000	Dukatz	
		US-6,170,881	01/09/2001	Salmon et al.	
		US-6,185,892	02/13/2001	Calvanella	
		US-6,258,150	07/03/2001	Rosenthal	
		US-6,277,232	08/21/2001	Wang et al.	
		US-6,831,787	12/14/2004	Scarbrough et al.	
		US-6,833,960	12/21/2004	Scarbrough et al.	
		US-6,856,462	02/15/2005	Scarbrough et al.	

Examiner Signature	/Dawayne Pinkney/	Date Considered	07/28/2008
*Examiner: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to client.			

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /DP/

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Receipt date: 02/25/2008 12026069 - GAU: 2873

PTO/SB/08A (04-03)

Approved for use through 4/30/2003. OMB 0651-0031)

U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE

Substitute for form 1449A/PTO INFORMATION DISCLOSURE STATEMENT BY APPLICANT (use as many sheets as necessary)	Complete if Known				
	Application Number		12/026,069		
	Filing Date		02/05/2008		
	First Named Inventor		Joel Scott Scarbrough		
	Group Art Unit		2873		
Examiner Name		PINKNEY			
Sheet	2	of	2	Attorney Docket number	1094-00235

U.S. PATENT DOCUMENTS					
Examiner Initials*	Cite No.	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number-Kind Code			
/DP/		US-6,979,487	12/27/2005	Scarbrough et al.	
/DP/		US-7,048,307	05/23/2006	Scarbrough et al.	
/DP/		US-2003/0227688	12/11/2003	Houlihan et al.	
		US-			
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FOREIGN PATENT DOCUMENTS					
Examiner Initials	Cite No.	Foreign Patent Document	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Country Code Number-Kind Code			
/DP/		WO-91/02270	02/21/1991	Loran Corporation	
/DP/		JP-6334925	12/02/1994	Fuji Photo Optical Co., Ltd.	Abstract attached

Examiner Signature	/Dawayne Pinkney/	Date Considered	07/28/2008
*Examiner: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to client.			

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /DP/

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Industria y Comercio SUPERINTENDENCIA	
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SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO



No. 10-095786- -00000-0000

Fecha: 2010-08-05 15:31:18 Dep. 2020 DIR NUEVASCR
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Act. 411 PRESENTACION Folios: 146

PATENTE DE INVENCION ☐

MODELO DE UTILIDAD ☐

Art 33 Decisión 486/00

☐	Indicación que se solicita una patente.
☐	Datos de identificación del solicitante o de la persona que presenta la solicitud
☐	Descripción de la invención
☐	Dibujos de ser estos pertinentes
☐	Comprobante de pago de las tasas establecidas (De ser el caso formato de descuento)
Completa ☐	Incompleta ☐

PATENTE DE INVENCION PCT ☒ MODELO DE UTILIDAD PCT ☐ Art.33 Decisión 486/00, Circular Única

☒	Indicación que se solicita una PCT
☒	Copia de la solicitud en español, tal como fue presentada inicialmente (capítulo descriptivo, reivindicatorio, resumen)
☒	Dibujos de ser estos pertinentes
☒	Comprobante de pago de las tasas establecidas (de ser el caso formato de descuento)
Completa ☒	Incompleta ☐

DISEÑO INDUSTRIAL ☐

(Art. 119 Decisión 486/00)

☐	Indicación que se solicita Diseño industrial
☐	Datos de identificación del solicitante o de la persona que presenta la solicitud
☐	Representación gráfica y fotográfica del Diseño industrial o muestra del material que incorpora el diseño
☐	Comprobante de pago de las tasas establecidas
Completa ☐	Incompleta ☐

ESQUEMA DE TRAZADO ☐

(Art. 92 Decisión 486/00)

☐	Indicación que se solicita un esquema de trazado
☐	Datos de identificación del solicitante o de la persona que presenta la solicitud
☐	Representación gráfica de un esquema de trazado
☐	Comprobante de pago de las tasas establecidas
Completa ☐	Incompleta ☐