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Industria y Comercio
SUPERINTENDENCIA

Delegatura de Propiedad Industrial
División de Nuevas Creaciones

PCT
SOLICITUD
PATENTE DE INVENCION

04-10/453

21. EXPEDIENTE No.

54. TITULO Vehículos de Mezcla Estabilizante de viscosidad
para preparar tintas de impresión flexográficas Basadas
en agua.

51. CLASIFICACION INTERNACIONAL

71. SOLICITANTE CO9D 11/10

DOMICILIO Port Lee, Nj. Estados Unidos

74. APODERADO Lilia Maria Rodriguez D' Aleman

22. BOGOTA, D.C., Oct. 11/04

FORMULARIO ÚNICO DE SOLICITUD DE PATENTE
PCT
ENTRADA EN FASE NACIONAL

1) **SOLICITUD DE:**
☒ **Patente de invención** ☐ **Patente de Modelo de Utilidad**

☒ **Capítulo I.** ☐ **Capítulo II.**

2) SOLICITANTE (71)	Nombre: SUN CHEMICAL CORPORATION	IDENTIFICACIÓN C.C. ☐ NIT: ☐ C.E. ☐ OTRO ☐ Cual _____ NÚMERO _____
	Dirección: 222 Bridge Plaza South, Fort Lee, NJ 07024 USA Nacionalidad o domicilio: Fort Lee, NJ, Estados Unidos Lugar de constitución: Delaware, Estados Unidos	
	Teléfono: _____ Fax: _____ E. Mail: _____	

3) REPRESENTANTE O APODERADO	Nombre: DILIA MARIA RODRIGUEZ D'ALEMAN	IDENTIFICACIÓN C.C. ☒ NIT: ☐ C.E. ☐ OTRO ☐ NÚMERO: 41.854.882 TP: 20824 CSJ
	Dirección: Carrera 11 N°. 93-43 Of. 404 Santafé de Bogotá D.C. Teléfono: 6350835 Fax: 6350824 E. Mail: clarkernodet@clarkernodet.com.co	

4) INVENTOR (ES) (72)	Nombre: 1. SPRYCHA, Ryszard; 2. MORA, Leda; 3. AUERBACH, Robert; 4. CATENA, Robert Dirección: 1. 2 Hillside Terrace, Wallington, NJ 07057 USA; 2. 176 Menrhof Road, Little Ferry, NJ 07643, USA; 3. 35 Hawthorne Drive, Princeton Junction, NJ 08550 USA; 4. 78 Plenge Drive, Belleville, NJ 07109 USA Nacionalidad o Domicilio: Todos los anteriores estadounidenses
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5) **PCT (86)**
Solicitud Internacional No. PCT/US2003/011233 Fecha: Abril 10, 2002²⁰⁰³
Publicación Internacional No. WO 2003/087239 A3 Fecha: Oct. 23, 2003

6) **Título (54) VEHÍCULOS DE MEZCLA ESTABILIZANTE DE VISCOSIDAD PARA PREPARAR TINTA DE IMPRESIÓN FLEXOGRÁFICAS BASADA EN AGUA**

7) **Clasificación Internacional: C09D 11/10**

8) PRIORIDAD	33) País de Origen	(32) Fecha	(31) Número de Solicitud
SI ☒ NO ☐	Estados Unidos	Abril 10, 2002	60/371,461

9) **Comprobante de pago N°. 04-77,070 Fecha: Septiembre 29, 2004**

✓

SUPERINTENDENCIA : SUPERLJO
Radiracion : 04101453 00000000 Folios: 70
Fecha (AMB): 2004-10-11 16:54:02
Tramite : 011 PCT-PATENT 370 FASE INCI 411 PRESENTA
Dependencia: 2020 DIVISION DE NUEVAS CREACIONES

NIT : 800176089-2

RECIBO OFICIAL DE CAJA : 04 - 77,070
FECHA : SEPTIEMBRE 29 DE 2004

***** CONSIGNACION *****

DEPOSITANTE	TIPO PAGO	BANCO	CUENTA	No. PAGO	FECHA PAGO	Vr. PAGO
CLARKE NOBET Y CO. COLOMBIA	CONSIGNACION	BANCO POPULAR	050-00110-6	23291515	29/09/2004	2,038,000.

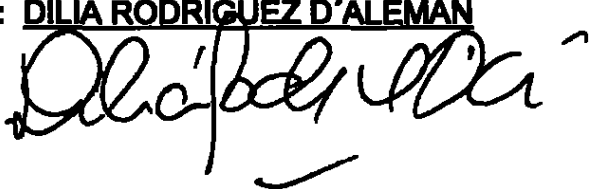
***** CONCEPTO *****

CANT.	RENTISTICO	CONCEPTO	TOTAL CONCEPTO
1	50005-01-01	SOLICITUDES	
1		TRAMITES DE SOL. DE PATENTE DE IN	422,000.00
		TOTAL :	422,000.00

BON: CUATROCIENTOS VEINTIDOS MIL PESOS

RESPONSABLE : 

RECIBO DE CAJA APLICADO AL EXPEDIENTE No. _____

10)	ANEXOS
☒ Comprobante de pago de la tasa de presentación de la solicitud ☐ Comprobante de pago por reivindicación de prioridad ☐ Documento que acredita la existencia y representación legal cuando el solicitante sea persona Jurídica ☒ Poderes, si fuera el caso ☒ Documento de cesión del inventor al solicitante o a su causante ☐ Declaraciones ☒ Copia de la solicitud Internacional. (Resumen, descripción, reivindicación, Dibujos). ☒ Traducción de la solicitud Internacional al castellano. (Resumen, descripción, reivindicación, Dibujos) ☐ Copia del examen preliminar efectuado por la IPEA ☐ De ser el caso, copia del 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 depósito del material biológico ☐ Arte final 12 x 12 y 6 x 6 cm ☐ De ser el caso, información sobre otras solicitudes de patente o títulos obtenidos en el extranjero por el mismo titular o su causante, relacionados parcial o totalmente con la invención de esta solicitud. ☒ Otros: 1. Solicitud PCT 2. Hoja de cálculo 3. Notificación de transmisión del reporte de búsqueda 4. Reporte de búsqueda	
11) FIGURA CARACTERÍSTICA:	
12) Solicitud concesión de la patente,	NOMBRE: <u>DILIA RODRÍGUEZ D'ALEMAN</u>  FIRMA: _____ C.C. 41.654.882 de Bogotá TP 20824 CSJ

TRADUCCIÓN OFICIAL No. 01/074 de un documento escrito en inglés, el cual para su identificación se sella con el sello del traductor al tiempo con la presente. Esta traducción ha sido preparada por Juan Pablo Piedrahita Aguilera, Traductor e Intérprete Oficial debidamente reconocido de conformidad con el Certificado de Idoneidad Profesional No. 0045 expedido por la Universidad Nacional de Colombia.

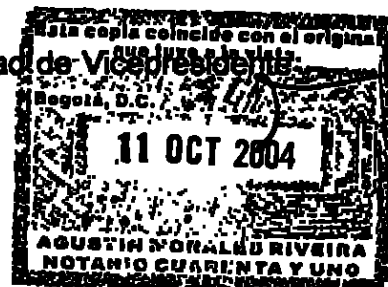
(Se traduce un Certificado de Notarial, Legalización y Apostilla escritos en inglés, adjuntos a un poder otorgado por la compañía SUN CHEMICAL CORPORATION, escrito en inglés y español, con fecha Febrero 13, 2001.)

CERTIFICADO NOTARIAL (Cuando el Solicitante es una Sociedad)

(Poderes otorgados en El Salvador, México, Estados Unidos de América y Venezuela)

Expedido hoy 13 de Febrero, 2001 el suscrito Notario CERTIFICA que:

- 1) Melvin M. Cox (nombre de la persona que firma el poder), mayor de edad y domiciliada en Fort Lee, New Jersey, suscribió el anterior documento.
- 2) El otorgante le es conocido personalmente y tiene facultad legal para firmar el documento.
- 3) El otorgante ha suscrito el anterior documento en su calidad de Vicepresidente de la persona jurídica Sun Chemical Corporation.



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4) La mencionada persona jurídica con domicilio comercial en 222 Bridge Plaza South, Fort Lee, New Jersey, está debidamente constituida, tiene actualmente existencia legal y el fin para el cual se otorga este poder se encuentra dentro de su objeto social.

5) El otorgante tiene en efecto la idoneidad referida y su representación es legal y está autorizado para otorgar este poder.

6) Fundamento las certificaciones 3), 4) y 5) en los documentos auténticos que para tal fin me fueron exhibidos.

(Firmado) Elizabeth C. Reyes

Notario Público

(Sello Notarial a Tinta: S. Elizabeth C. Reyes, Notario Público para New Jersey, Mi Comisión Expira Febrero 13, 2002)

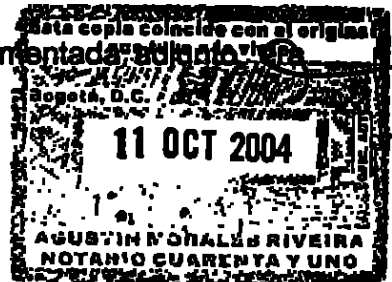
(Sello Notarial Redondo en Relieve)

Nota: El Consulado de Colombia debe autenticar la firma del notario público.

ESTADO DE NEW JERSEY,

CONDADO DE BERGEN} ss. :

Yo, Kathleen A, Donovan, Escribano del Condado de Bergen, (el mismo siendo una Corte de Registro de dicho Condado, que tiene por ley un sello), POR EL PRESENTE CERTIFICO QUE Elizabeth C. Reyes, cuyo nombre está suscrito en el certificado de reconocimiento, prueba o declaración juramentada, adjunto, es



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en el momento de recibir tal reconocimiento, prueba o declaración juramentada un NOTARIO PUBLICO debidamente comisionado, juramentado y residente en dicho Estado y como tal NOTARIO PÚBLICO, es un funcionario de dicho Estado debidamente autorizado por sus leyes para tomarlos y certificarlos, asó como para tomar y certificar las pruebas y reconocimientos de escrituras para traspasos de tierra, tenencias o herencias, y otros instrumentos por escrito, para registro en dicho Estado; y que dicho reconocimiento está debidamente firmado y tomado conforme a las leyes de dicho Estado y que estoy bien familiarizado con su caligrafía y verdaderamente creo que la firma en el certificado adjunto es su firma auténtica.

Además certifico que no se requiere por las leyes de este Estado que la impresión del sello de dicho NOTARIO PÚBLICO esté en los archivos de mi oficina.

EN TESTIMONIO DE LO CUAL firmo y estampo mi sello oficial hoy 13 de Febrero de 2001 A.D.

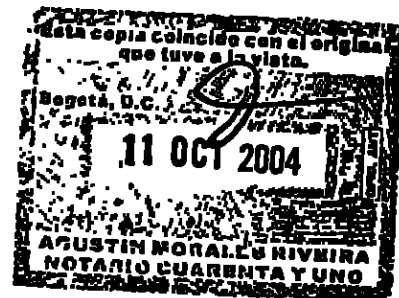
(Firmado) Kathleen A. Donovan, Escribano

(Sello en Relieve del Condado de Bergen, NJ)

APOSTILLA

(Convención de la Haya de Octubre 5 de 1961)

1. País: Estados Unidos de América
Este documento público
2. Ha sido firmado por Kathleen A. Donovan



3. Actuando en calidad de Escribano del Condado
4. Lleva el sello/estampilla de Condado de Bergen

CERTIFICADO

5. En Trenton, New Jersey 6. Hoy 21 de Febrero, 2001
7. Por Peter R Lawrence, Tesorero de New Jersey
8. Certificado Número A128014
9. (SELLO)

(Sello Redondo de Oblea en Relieve)

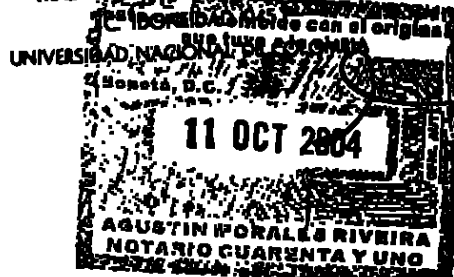
10. Firma: (Firmado) Peter R Lawrence

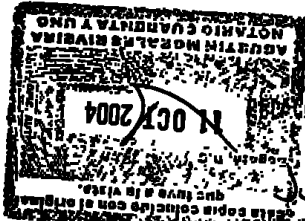
Certificado de Apostilla No. A128014 por el Tesorero de New Jersey, de fecha
Febrero 21, 2001.

ES TRADUCCIÓN FIEL Y COMPLETA de la cual se deja copia en los archivos de
esta oficina para su confrontación y a la cual me remito.

Bogotá, Marzo 8 de 2001.

TRADUCCION OFICIAL No. C/C71
JUAN PABLO PIEDRAHITA AGUILERA
TRADUCTOR E INTERPRETE OFICIAL





MINISTERIO DE
FIRMA APARECE EN EL
DOCUMENTO DESEMPEÑA
LAS FUNCIONES INDICADAS

245262
Juan P. ...

NO SE ASUME
RESPONSABILIDAD DEL TEXTO

2004 JUL 28 A 11:54

mes
JEFE DE LEGALIZACIONES
SECRETARIA D.C.

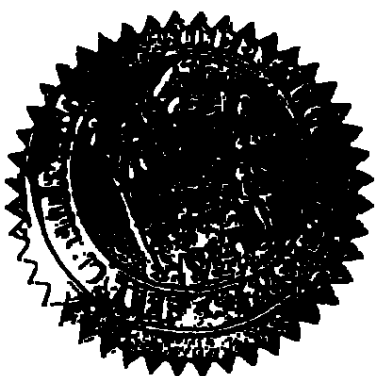
APOSTILLE

(CONVENTION DE LA HAYE DU 5 OCTOBRE 1961)

- 1. COUNTRY: UNITED STATES OF AMERICA
- 2. THIS PUBLIC DOCUMENT HAS BEEN SIGNED BY:
KATHLEEN A DONOVAN
- 3. ACTING IN THE CAPACITY OF:
COUNTY CLERK
- 4. BEARS THE SEAL/STAMP OF:
COUNTY OF BERGEN

CERTIFIED

- 5. AT TRENTON, NEW JERSEY
- 6. THE 21ST DAY OF FEBRUARY 2001
- 7. BY: Peter R Lawrance, NEW JERSEY TREASURER
- 8. NO. A128014
- 9. SEAL/STAMP:
- 10. SIGNATURE



Peter R Lawrance

Esta copia coincide con el original.
TRADUCCION OFICIAL. No se cobra tarifa.
JUAN PABLO RIEDA ALFARO, C.O.T. 12345
TRADUCTOR E INTERPRETE OFICIAL
C. D. DONEDAD, 15 OCT 2004
UNIVERSIDAD NACIONAL DE COLOMBIA
AGUSTIN MORALES RIVERA
NOTARIO PUBLICO

STATE OF NEW JERSEY,
COUNTY OF BERGEN) SS:

I, Kathleen A. Donovan, Clerk of the County of Bergen
(the same being an office of Record of the aforesaid County,
having by law a seal)

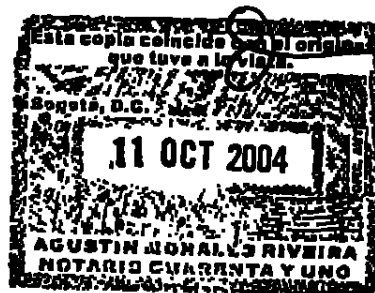
DO HEREBY CERTIFY, That Elizabeth C. Reyes
whose name is subscribed to the attached certificate of acknowledgement, proof or affidavit, was at the time of taking said
acknowledgement, proof or affidavit, a NOTARY PUBLIC, duly commissioned and sworn and residing in said State, and was,
as such NOTARY PUBLIC, an officer of said State duly authorized by the laws thereof to take and certify the same, as well as
to take and certify the proof and acknowledgement of deeds for the conveyance of land, tenements or hereditaments, and other
instruments in writing to be recorded in said State, and that the said acknowledgement is duly executed and taken according to
the laws of said State, and that I am well acquainted with his/her handwriting and verily believe the signature to the attached
certificate is his/her genuine signature.

And I do further certify that the impression of the seal of such NOTARY PUBLIC is not required by the laws of this
State to be filed in my office.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal this

13 day of February A.D. 20 01
Kathleen A. Donovan Clerk
Deputy

TRADUCCION OFICIAL No. 01/034
JUAN PABLO PIEDRAHITA AGUILERA
TRADUCTOR E INTERPRETE OFICIAL
C. IDONEIDAD 045
UNIVERSIDAD NACIONAL DE COLOMBIA



Clarke, Modet & Co. Colombia Ltda.

PROPIEDAD INDUSTRIAL y DERECHOS DE AUTOR

Apertado Aereo 92397

Santafé de Bogotá, Colombia

PODER

Yo (nosotros), abajo firmante(s)

Melvin M Cox

en mi (nuestro) carácter de representante(s) legales de

Sun Chemical Corporation

una sociedad organizada y existente de acuerdo con las leyes de

Delaware

y en actual cumplimiento de su objeto social, con domicilio en

*222 Bridge Plaza South
Fort Lee NJ 07024 USA*

por el presente instrumento confiero (conferimos) poder especial a favor de DILIA MARIA RODRIGUEZ D'ALEMAN, con Cédula de Ciudadanía No. 41.654.882 de Bogotá, y tp. 20824 y CLAUDIA LUCIA CARO RAMIREZ, con Cédula de Ciudadanía No. 40.017.374 de Tunja, y tp. 36448, con domicilio en Santa Fé de Bogotá, Colombia, para que actuando en su orden en nombre del (de la) otorgante le (la) representen ante cualquier entidad, autoridad y/o persona, especialmente ante las del orden Administrativo, Contencioso Administrativo, Judicial, Tribunales de Arbitramento y/o cualquier otro en lo referente a los siguientes asuntos:

- 1) Solicitar, tramitar, obtener y/o registrar cualquiera de las modalidades de Propiedad Industrial, tales como: patentes de invención, modelos de utilidad; diseños industriales, variedades vegetales; marcas, lemas, nombres y enseñanzas comerciales y denominaciones de origen; así como sus renovaciones, prórrogas, transferencias, cambios de nombre y/o domicilio, contratos y licencias.
- 2) Solicitar, tramitar, obtener y/o registrar derechos de autor, en cualquiera de sus presentaciones así como la protección de secretos industriales y know-how.
- 3) Solicitar, tramitar, obtener y/o registrar registros sanitarios, permisos y/o licencias de funcionamiento; así como sus renovaciones o prórrogas, transferencias, cambios de nombre y/o domicilio, contratos y licencias.
- 4) Ejercer acciones de oposición, observación, reclamos, reconsideración, reposición, apelación, cancelación administrativa o judicial, nulidad, protección al consumidor, concesión de licencias, protección de secretos industriales y demás acciones y recursos relacionados con derechos derivados de los asuntos arriba indicados y en contra de la competencia desleal, acciones derivadas de la obtención o explotación de licencias, acciones de indemnización de perjuicios. También podrán intervenir en juicios civiles, comerciales, penales, contencioso-administrativos, tutelados y de policía; en acciones o juicios promovidos por el (la) mandante o en contra el (ella).
- 5) Registrar nombres de dominio ante la entidad competente.
- 6) En el ejercicio de este mandato los mandatarios arriba mencionados quedan facultados para: conciliar, cancelar, transigir, comprometer en árbitros, desistirse, recibir y tomar posesión de la cosa objeto de litigio y renunciar o desistirse a derechos concedidos o en curso de concesión, admitir los hechos del proceso.
- 7) Ratificar o no la agencia oficiosa.
- 8) Así mismo faculta (facultamos) a los mencionados apoderados para recibir notificaciones y designar apoderados judiciales o extrajudiciales, sustituir el presente poder y revocar las sustituciones que hicieren.

Dado y firmado en *Fort Lee NJ USA*

a los *13* días de *Febr* de *2001*

Melvin M. Cox

Firma y manifiesto

By: Melvin M. Cox, Vice President, Sun Chemical, Corp.

POWER OF ATTORNEY

I (we), the undersigned

Melvin M. Cox

legal representative(s) of

Sun Chemical Corporation

an organization existing under the laws of

Delaware

and in present execution of its business activity, domiciled at

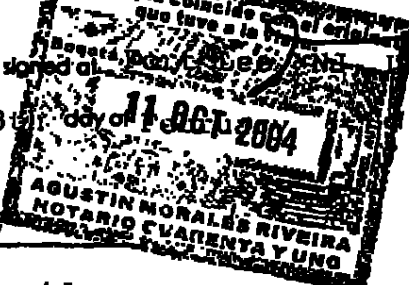
*222 Bridge Plaza South
Fort Lee, NJ 07024 USA*

do hereby grant POWER OF ATTORNEY to DILIA MARIA RODRIGUEZ D'ALEMAN, Identification card No. 41.654.882 of Bogotá, and tp. 20824 and CLAUDIA LUCIA CARO RAMIREZ, tp. 36448, Identification card No. 40.017.374 of Tunja, residing in Santa Fé de Bogotá, Colombia, to act in the order of their appointment in behalf of grantor before any entity, authority and/or natural or juridical person, specially before those Administrative, Administrative-Contentious, Judicial, arbitration courts, and/or any other, in all matters concerning the following:

- 1) To apply, process, obtain and/or register any of the modalities of Industrial Property, such as: Patents of Invention, Utility Models; Designs, vegetal varieties; Marks, Slogans, Trade Names and emblems and appellations of Origin; as well as their renewals, extensions, assignments, changes of name and/or domicile, agreements and licenses.
- 2) To apply, process, obtain and/or register copyrights of any kind as well as protection of industrial secrets or know-how.
- 3) To apply, process, obtain and/or register sanitary registrations, operating authorizations and/or licenses; as well as their renewal or extensions, assignments, changes of name and/or domicile, agreements and licenses.
- 4) To bring actions of opposition, observations, claims, reconsideration, appeal or legal remedies, cancellations, nullity, protection to the consumer, granting of licenses, protection of trade secrets and other actions related with rights derived from the above-mentioned matters and against the unfair competition, actions resulting from the obtaining or exploitation of licenses, recovering damages actions. They can also intervene or participate in Civil, Commercial, Criminal or Contentious-Administrative trials; the actions for writ mandamus, police actions; in actions, lawsuits or litigations instituted by the grantor or against him.
- 5) To register domain names before the competent entity.
- 6) To the effect of this mandate the above-named proxy are empowered to: conciliate, cancel, settle, submit to arbitration, withdraw and to receive and take possession of the litigation related object and waive or renounce the rights granted or in process of granting, admit the facts of the case.
- 7) To ratify or not the officious agency.
- 8) I (we) hereby appoint the afore mentioned attorneys with powers to receive notifications and to designate judicial and extrajudicial attorney; to substitute this Power of Attorney and to revoke such substitution.

Granted and signed at *Fort Lee, NJ, USA*

on this *13* day of *February* 2001



UNIVERSIDAD NACIONAL DE COLOMBIA

CERTIFICADO NOTARIAL (Cuando el solicitante es SOCIEDAD)

(Poderes otorgados en: El Salvador, Estados Unidos, Mexico y Venezuela)

A los _____ días del mes de _____
de _____, el Notario que suscribe DA FE de
que:

1. _____
(nombre de la persona que firma el poder)

mayor de edad y domiciliado _____
_____ firmó de su puño
y letra el documento que antecede.

2. Conoce al (a la) otorgante y que este (a) está
legalmente capacitado para el otorgamiento.

3. El otorgante ha firmado el referido documento en
su carácter e _____
de la persona jurídica _____

4. La citada persona jurídica con sede en _____
_____ está

legalmente constituida, que tiene actualmente
existencia legal y que el acto para el cual se ha
otorgado este poder está comprendido entre los que
constituyen su objeto social.

5. El otorgante tiene efectivamente la representación
que ostenta, que esta es legítima y que está
facultado para otorgar este poder.

6. Las anteriores certificaciones de los puntos 3, 4 y 5, me
constan porque he tenido a la vista los
documentos auténticos.

Notario Público

NOTA: A continuación de lo anterior, el Consul de
Colombia debe autenticar la firma del Notario Público.

CERTIFICADO NOTARIAL (Cuando el solicitante es INDIVIDUO)

A los _____ días del mes de _____
de _____, el Notario que suscribe DA FE de
que:

1. _____
(nombre de la persona que firma el poder)

mayor de edad y domiciliado en _____
_____ firmó en su presencia
el documento que antecede, conoce al otorgante
y que este está legalmente capacitado para el
otorgamiento.

Notario Público

NOTA: A continuación de lo anterior, el Consul de
Colombia debe autenticar la firma del Notario Público.

Para todos los demás países el Señor Consul de
Colombia a quien se otorgue, debe expedir una
certificación de constancia 1) de la existencia
legal de la sociedad; 2) de que esta ejerce actualmente
su objeto social; y 3) de que la persona o personas que
otorgan el poder están facultadas para hacerlo, dejando
constancia en mismo de que tuvo a la vista las pruebas
que sustentan tales circunstancias.

NOTARIAL CERTIFICATE (When the applicant is a CORPORATION)

(Powers of attorney granted in: El Salvador, Mexico, U.S.A. and Venezuela)

This 13th day of February 2001,
the undersigned Notary CERTIFIES that:

1. Melvin M. Cox
(name of the person who signs the power of attorney)

of legal age and domiciled
in Fort Lee, NJ
set his hand on the foregoing document.

2. The grantor is to him personally known and that
he/she has legal capacity to execute the document.

3. The grantor has executed the foregoing document
in his capacity of Vice President
of the juridical person Sun Chemical Corporation

4. The mentioned juridical person with place of
business in 222 Bridge Plaza South, Fort Lee NJ
is duly organized, has actual legal existence and that
the purposes for which the power of attorney is granted
are within the scope of its corporate purposes.

5. The grantor has in fact the referred quality and
that his/her representation is legal and that he/she
is empowered to grant this power of attorney.

6. I have based the above certifications 3, 4 and 5, on
the authentic documents which for such purpose were
exhibited to me.

ELIZABETH C. REYES

A Notary Public of New Jersey
My Commission Expires February 13 2002

Notary Public

NOTA: Then the Colombian Consul must legalize the
signature of the Notary Public.

NOTARIAL CERTIFICATE (When the applicant is an INDIVIDUALS)

On this _____ day of _____
the undersigned Notary CERTIFIES that:

1. _____
(name of the person who signs the Power of Attorney)

of legal age and domiciled at _____
_____ signed in his presence
the foregoing document, the grantor is to him
personally known and that he/she has legal capacity to
execute the document.

Notary Public

NOTA: Then the Colombian Consul must legalize the
signature of the Notary Public.

For all other countries the Colombian Consul or before
who it is granted must issue a certification stating 1) the
legal existence of the corporation, 2) that the corporate
purposes are actually being accomplished, 3) that the
person or persons who grant this Power of Attorney are
empowered to do it. The Consul will certify also that the
documents evidencing those circumstances were
exhibited to him.

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
23 October 2003 (23.10.2003)

PCT

(10) International Publication Number
WO 03/087239 A2

- (51) International Patent Classification¹: C09D 11/00 (74) Agent: PERSLEY, Sidney; 222 Bridge Plaza South, Fort Lee, NJ 07024 (US).
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(54) Title: VISCOSITY STABILIZING BLEND VEHICLES FOR PREPARING WATER BASED FLEXOGRAPHIC PRINTING INKS

(57) Abstract: A long term storage viscosity stabilizing blend vehicle for water based flexographic printing inks having a styrenated acrylic polymer, an acetylene diol surfactant, and a silicone based de-foaming agent. The blend vehicle further containing at least one rheology modifying urea and/or sorbitol which further improve viscosity stability.

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VISCOSITY STABILIZING BLEND VEHICLES FOR PREPARING WATER BASED FLEXOGRAPHIC PRINTING INKS

5 Field of the Invention

This invention relates to the field of printing ink vehicles useful for preparing water based flexographic printing inks. More specifically, the invention relates to improving the long-term storage viscosity stability of such printing inks by use of such vehicles and rheology modifying additives which improve ink gloss and color strength.

10

Background of the Invention

Printing inks for flexographic printing systems are well known in the art. In recent years, there has been a steady trend to utilize water based flexographic printing inks to eliminate, or at least minimize, the environmental and health problems associated with the use of volatile organic compounds (VOCs) contained in conventional flexographic printing inks that are released into the pressroom and atmosphere. Although numerous water based printing ink formulations have been developed, these inks have generally exhibited poor long term storage viscosity stability. Specifically, upon aging, the storage viscosity of such inks increases significantly, up to the point where complete gelation of the ink will occur. This causes severe problems for both printing ink manufacturers and printers utilizing the inks. The problem is particularly severe for printing inks employing yellow, red or orange pigments. Accordingly, there is a need for water based flexographic printing inks, especially those incorporating yellow, red or orange pigments, having good long term storage viscosity stability.

In the field of printing ink, it is also desirable to be able to prepare a variety of water based flexographic inks from a wide range of pigments, in a fast, efficient and economical way. One way to do this is to provide a vehicle (i.e. blend vehicle) for the printing ink that contains substantially all of the components necessary for the final printing ink composition. This would include rheology modifying agents and rub resistance additives. In formulating the printing ink composition in this way the pigment, usually added as a water based pigment dispersion, is all that is required. The pigment or water based pigment dispersion is added to the blend vehicle in a relatively simple, usually single step, mixing process to formulate the printing ink composition. Since the blend vehicle is prepared in a separate step, a generalized blend vehicle for use with a variety of aqueous based pigment dispersions can be prepared in advance and stored. In this way a large number of printing ink compositions can be prepared

5 from a common blend vehicle, with certain other components specific to a particular pigment or aqueous pigment dispersion being added in the mixing step, or adjustments to the composition of certain components of the blend vehicle can be made in the mixing step. Alternatively, custom blend vehicles for use with specific pigments or aqueous based pigment dispersions can be prepared and stored allowing a printing ink of a particular color to be prepared quickly and
10 efficiently using a specially blend vehicle.

We have discovered that the incorporation and use of certain blend vehicles in the preparation of water based flexographic printing inks can greatly improve the long term storage viscosity stability of the ink, especially when the more challenging yellow, red, or orange pigments and aqueous based pigment dispersions are used to formulate the ink. Accordingly,
15 we have developed water based flexographic printing ink compositions which incorporate these blend vehicles. We have also discovered that long-term storage viscosity stability of these inks can be enhanced by the further addition of certain rheology modifiers. As a benefit, we have also discovered that the further addition of these modifiers can have a further beneficial effect on certain other ink properties, which include, but is not limited to, gloss and color strength.

20

Summary of the invention

The invention is a long-term storage viscosity stabilizing blend vehicle for use in preparing viscosity stable water based flexographic printing ink compositions made of: (a) a styrenated acrylic polymer having a glass transition temperature (T_g) of about 48 °C to about 52
25 °C, and an acid number of about 65 to about 75; (b) an acetylene diol surfactant having an HLB value between 3 and 10; and (c) a silicone based de-foaming agent.

In another aspect, the invention is viscosity stable water based flexographic printing ink compositions prepared using the blend vehicle of the present invention and conventional pigments or water based pigment dispersions used to formulate flexographic printing inks.
30

Detailed Description of the invention

The blend vehicles for the water based flexographic printing inks of the present invention incorporate a styrenated acrylic polymer, having a glass transition temperature (T_g) of about 48 °C to about 52°C, and an acid number of about 65 to about 75. The styrenated polymer is
35 preferably used in an amount from about 74 wt. % to about 84 wt. %, based on the weight of the blend vehicle.

The blend vehicle also incorporates an acetylene diol surfactant having an HLB value between 3 and 10. The HLB or hydrophilic/lipophilic balance of a surfactant represents the suitability of the surfactant to stabilize an emulsion of either the macroemulsion type (opaque, particle size >400 nm, low stability) and/or the microemulsion type (optically clear, thermodynamically stable, particle size <100 nm). An HLB value of 20 is assigned, for example,
40

5 to nonionic surfactants of the ethoxylate type containing entirely ethylene oxide units and an HLB value of 0 is assigned to completely water insoluble products containing no ethylene oxide fragments. Most HLB values fall between these two numbers. An empirical relationship to arrive at HLB values is $[HLB = \% \text{ of the hydrophilic groups (molar) divided by 5}]$. The surfactant employed in the present invention serves to enhance the wetting of the pigment by the water by
10 lowering the interfacial tension, facilitate the mechanical process, and stabilize the water based dispersion by controlling the flocculation of particles. A particularly preferred surfactant found to be most suitable in preparing the blend vehicles of the present invention is the nonionic surfactant Surfynol 104 (Surfynol is a registered trademark and product of Air Products Corporation, Allentown, PA) based on a hydrocarbon moiety modified by acetylene chemistry
15 and shows superior performance in water base compositions. The blend vehicle, according to the present invention, may further include a second surfactant, which is different from the acetylene diol surfactant. The acetylene diol surfactant is preferably used in an amount of about 0.8 wt.% to about 1.2 wt. %, based on the weight of the blend vehicle.

The blend vehicles of the present invention also require the use of a silicone based de-foaming agent, which is preferably used in an amount from about 0.15 wt. % to about 0.25 wt. %, based on the weight of the blend vehicle. The blend vehicle, according to the present invention, may further include a second de-foaming agent, which is different from the silicone based defoaming agent.

It has been discovered that the use of styrenated acrylic polymers of the above-described type greatly improve the viscosity stability of flexographic printing inks prepared with
25 blend vehicles of the present invention over printing inks formulated with standard or conventional blend vehicles formulated without such component.

In addition, the viscosity stabilizing effect of the blend vehicle preparing the water based flexographic printing ink compositions of the present invention is further improved by
30 incorporating at least one, and preferably a combination of a urea or urea derivative such as urea, methyl urea, or ethyl urea and a polyhydric alcohol (e.g. sorbitol). Each acts as rheology modifiers and, together with the styrenated acrylic polymer, provide a synergistic and unexpected further improvement in viscosity stabilization. The urea, when present, is used in an up to about 10 wt. %, based on the weight of the blend vehicle. The polyhydric alcohol or
35 sorbitol, when present, is used in an amount up to about 10 wt. % based on the weight of the blend vehicle. This is illustrated in Table 1 below.

A preferred embodiment of the blend vehicle of the present invention would include a wax or wax compound, such as polyethylene wax, which acts to provide rub-resistance to the final printing ink composition. A wax or wax compound, when present, is used in an amount
40 up to 5 wt %, based on the weight of the blend vehicle.

Water based flexographic printing ink compositions prepared according to the present invention are formulated by adding at least one pigment which is typically provided in the form of

- 5 an aqueous pigment dispersion. The dispersion typically has a solids (pigment) content of about 15 wt % to about 45 wt %, based on a total weight of the dispersion. The water content of the printing ink composition of the present invention is derived from the aqueous portion of the styrenated acrylic polymer, or from the aqueous portion of the water based pigment dispersion or both. The amount of water present is up to 20 wt %, based on the weight of the ink composition.
- 10

- In formulating water based flexographic printing ink compositions from blend vehicles, according to the present invention, a water based dispersion, in an amount from about 35 wt. % to about 65 wt. %, based on the weight of the ink composition, is mixed with the blend vehicle. The blend vehicle is added in an amount from about 35 wt. % to about 65 wt. %, based on the weight of the ink composition. Especially significant increases in long-term viscosity stability have been achieved by the blend vehicles present invention when used to formulate water based flexographic printing inks employing yellow, red and orange pigments and aqueous based pigment dispersions.
- 15

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Table 1
Flexographic Inks made from Various Blend Vehicles

	Standard (Example 4)	Example 5	Example 6 (w/ Urea)	Example 7 (w/ sorbitol)
Viscosity Initial (#3 Signature Cup)	45	29	18	17
Viscosity 7 days (#3 Signature cup)	180	65	48	39
Gloss (SBS)	54	70	70	69
Gloss (Kemlar Lite)	19	28	27	28
Color Strength (SBS)	Standard	Stronger	Stronger	Stronger

25

Other aqueous pigment dispersions suitable for use in preparing water based flexographic printing ink compositions from the blend vehicles of the present invention are set forth below in the Table 2.

Table 2

Base	Pigment	Color	Color Index	Manufacturer
PMA140	White	White	PW 6	Sun Chemical
PMA220	AAOT Yellow	Yellow	PY 14	Sun Chemical
PMA221	AAOT Yellow	Yellow	PY 14	Sun Chemical
PMA222	Yellow	Yellow	PY 3	Sun Chemical
PMA320	Orange	Orange	PO 5	Sun Chemical
PMA324	Orange	Orange	PO 16	Heucotech
PMA325	Orange	Orange	PO 16	Drew
PMA400	Lithol	Red	PR 49:1	Sun Chemical
PMA405	Lithol	Red	PR 49:2	Sun Chemical
PMA460	Clarion	Orange	PO 46	Sun Chemical
PMA462	Naphthol	Red	PR 2	Heucotech
PMA464	Naphthol	Red	PR 23	Heucotech
PMA466	Rubine	Red	PR 57:1	Heucotech
PMA468	Rubine	Red	PR 57:1	Sun Chemical
PMA467	Rubine	Red	PR 57:1	Sun Chemical
PMA468	Rhodamine	Purple	PP 169	Heucotech
PMA469	Rhodamine	Violet	PV1	Heucotech
PMA525	Blue	Blue	PB 15:3	Sun Chemical
PMA526	Blue	Blue	PB 15:3	Sun Chemical
PMA530	Blue	Blue	PB 16	Heucotech
PMA542	Blue	Blue	PB 61	Heucotech
PMA600	Violet	Violet	PV 27	Heucotech
PMA602	Violet	Violet	PV 23	Sun Chemical
PMA604	Violet	Violet	PV 3	Sun Chemical
PMA720	Green	Green	PG 7	Sun Chemical
PMA900	Black	Black	PB 7	Sun Chemical
PMA950	Black	Black	PB 7	Sun Chemical
PMA980	Black	Black	PB 7	Sun Chemical
PMA990	Black	Black	PB 7	Sun Chemical

In addition, other pigments and pigment dispersions that can be used to prepare water based flexographic printing ink compositions according to the present invention include: red dispersions such as RCD-9572 Lithol Rubine and RS-8135 Naphthol Y/S, manufactured by Sun Chemical Corporation, Fort Lee, New Jersey; orange dispersions, such as OS-8088 Orange, manufactured by Sun Chemical Corporation; and white dispersions such as PMA 140, manufactured by Sun Chemical Corporation.

The pigment colorant portion of the aqueous based pigment dispersions to be mixed with the blend vehicle of the present invention, may be used individually or in combination with other pigments. The pigment may be in the form of a presscake, dry power, or a flush. Examples of suitable pigments are described or referenced herein by their Color Index No. and include: PY 14 (AAOT Yellow), PO 16 (Dianisidine Orange), PR 23 (BS Naphthol), PR 57:1, HS Lithol Rubine, PB 15:3 (Phthalo Blue), and PV 23 (Carbazole Violet)

It will be readily understood by persons of ordinary skill in the art that according to the present invention, it is usually preferable to prepare a separate blend vehicle for subsequent use in preparing water-based ink compositions having improved viscosity-stability, the present

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5 invention also encompasses the preparation of final water-based ink compositions, having all of the recited components, directly from the components, without the separate preparation of the blend vehicle.

The preparation of blend vehicles and water based flexographic printing ink compositions according to the present invention are set forth in the Examples below. In the
10 following examples, any "parts" or ratios are based on weight unless otherwise indicated.

Example 1 (Comparative Standard Vehicle)

An acrylic polymer (84 parts of Lucidene 612, "Lucidene" being a trademark of Rohm & Haas of Philadelphia, PA) was added to a polyethylene wax additive (5 parts of 59K-21PE, a
15 commercially available product of Sun Chemical), an acetylene diol surfactant (2 parts of Ex 649-68 from Sun Chemical) and a defoamer (1.2 parts of DeeFo 3010E/50, "Dee Fo" being a trademark of Ultra Additives, Inc of Paterson, NJ) with the balance of the formulation being water. The blend vehicle thus formed had a pH of 9.1.

The initial bulk viscosity of the blend vehicle and printing inks of the present invention
20 were measured by measuring the amount of time in seconds necessary for the blend vehicle to completely flow out of the indicated #2 Signature Cup. According to the above measurement, the blend vehicle had a measured bulk viscosity of 36 seconds.

Example 2

25 To a styrenated acrylic polymer (84 parts of Parachem RLS-B62) was added a polyethylene wax additive (5 parts of 59K-21PE), an acetylene diol surfactant (1 parts of Surfynol 104H of Air Products) and a defoamer (0.2 parts of DeeFo PI-40 by Ultra) with the balance of the formulation being water (9.8 parts). The blend vehicle thus formed had a pH of 9.1. According to the above method of measuring bulk viscosity, the blend vehicle had a
30 viscosity of 45 seconds.

Example 3 (w/ urea and sorbitol)

To a styrenated acrylic polymer (74 parts of Parachem RLS-B62) was added a polyethylene wax additive (5 parts of 59K-21PE), an acetylene diol surfactant (1 parts of
35 Surfynol 104H of Air Products), a defoamer (0.2 parts of DeeFo PI-40 by Ultra), urea (10 parts) and sorbitol (5 parts) with the balance of the formulation being water (4.8 parts). The blend vehicle thus formed had a pH of 9.1. According to the above method of measuring bulk viscosity, the blend vehicle had a viscosity of 20 seconds.

Example 4

To the blend vehicle of Example 1 (40.0parts) was added a naphthol red pigment base

5 (5.6 parts), an orange pigment base (53.4 parts) and glycol ether (1.00 part). The viscosity of the resulting ink composition was 45 while the ink was fresh (measured with a #3 Signature cup). The gloss was measured on the SBS substrate and was 54, and on the Kemlart-Lite as 19. The color strength was measured visually on the SBS and rated as standard.

10 The viscosity stability of the ink composition was measured as follows: 100 grams of the ink is placed in a 4 ounce jar and the lid is closed. The jar containing ink is then placed in an oven at 50 °C. After 7 days the ink is removed from the oven, allowed to come to room temperature and checked for flotation and settling. It is then mixed for 5 minutes and rechecked for viscosity. The viscosity of the ink composition of Example 3 after being aged seven days at 50 °C was 180.

15

Example 5

To the blend vehicle of Example 2 (40.0 parts) was added a naphthol red pigment base (5.6 parts), an orange pigment base (53.4 parts) and glycol ether (1.00 part). The viscosity of the resulting ink composition was 29 while the ink was fresh (measured with a #3 Signature cup). The gloss was measured on SBS substrate and was 54, and on Kemlart-Lite substrate and was 19. The color strength was measured on the SBS substrate and was rated visually as stronger than the ink made with the standard. The viscosity of the ink composition of Example 3 after being aged seven days at 50 °C was 65.

25

Example 6 (w/ urea)

To the ink composition of Example 4 was added urea (5 parts by weight). The viscosity of the fresh ink was 18, the SBS gloss was 70, the Kemlart-Lite gloss was 27, and the color strength on SBS was stronger. The viscosity of the ink after being aged five days at 50 °C was 48.

30

Example 7 (w/ sorbitol)

To the ink composition of Example 4 was added sorbitol (5 parts by weight). The viscosity of the fresh ink was 17, the SBS gloss was 69, the Kemlart-Lite gloss was 26, and the color strength on SBS was stronger. The viscosity of the ink after being aged five days at 50 °C was 39.

35

Example 8

To the blend vehicle of Example 1 (63.0 parts) was added a phthalo blue pigment base (24 parts), a lithol rubine base (3.5 parts), a black pigment base (1.5 parts) and a white pigment base (8.0 parts). The viscosity of the resulting ink composition was 37 while the ink was fresh

40

5 (measured with a #2 Signature cup). The viscosity after the ink was aged at 50°C for 7 days was 60.

Example 9

10 To the blend vehicle of Example 2 (60.0 parts) was added a phthalo blue pigment base (23 parts), a lithol rubine base (3.0 parts), a black pigment base (1.4 parts) and a white pigment base (7.6 parts). The viscosity of the resulting ink composition was 30 while the ink was fresh (measured with a #2 Signature cup). The viscosity after the ink was aged at 50°C for 7 days was 33.

Example 10

15 To the blend vehicle of Example 1 (35.05 parts) was added a lithol rubine pigment base (32 parts), a naphthol pigment base (13.65 parts), an orange pigment base (14.3 parts) and a white pigment base (5.0 parts). The viscosity of the resulting ink composition was 38 while the ink was fresh (measured with a #2 Signature cup). The gloss was measured on SBS substrate and was 48 and on the Kemlart-Lite as 33. The color strength was measured visually on the SBS and rated as standard.

Example 11 (w/ urea and sorbitol)

25 To the blend vehicle of Example 3 (35.05 parts) was added a lithol rubine pigment base (32 parts), a naphthol pigment base (13.65 parts), an orange pigment base (14.3 parts) and a white pigment base (5.0 parts). The viscosity of the resulting ink composition was 28 while the ink was fresh (measured with a #2 Signature cup). The gloss was measured on SBS substrate and was 54 and on the Kemlart-Lite as 36. The color strength was measured visually on the SBS and rated as stronger.

30

Example 12

To the blend vehicle of Example 1 (35.05 parts) was added a lithol rubine pigment base (32 parts), a naphthol pigment base (13.65 parts), an orange pigment base (14.3 parts) and a white pigment base (5.0 parts). The viscosity of the resulting ink composition was 41 while the ink was fresh (measured with a #2 Signature cup). The ink was aged for 5 days at 50°C and the resulting viscosity was 115.

35

Example 13 (w/ urea)

40 To the blend vehicle of Example 1 (35.05 parts) was added a lithol rubine pigment base (32 parts), a naphthol pigment base (13.65 parts), an orange pigment base (14.3 parts), a white pigment base (5.0 parts), and urea (5 parts). The viscosity of the resulting ink composition was

- 5 21 while the ink was fresh (measured with a #2 Signature cup). The ink was aged for 5 days at 50°C and the resulting viscosity was 75.

Example 14 (Comparative Standard Vehicle w/ sorbitol)

- 10 To the blend vehicle of Example 1 (35.05 parts) was added a lithol rubine pigment base (32 parts), a naphthol pigment base (13.65 parts), an orange pigment base (14.3 parts), a white pigment base (5.0 parts), and sorbitol (5 parts). The viscosity of the resulting ink composition was 22 while the ink was fresh (measured with a #2 Signature cup). The ink was aged for 5 days at 50°C and the resulting viscosity was 90.

15 **Example 15 (Comparative Standard Vehicle)**

- To the blend vehicle of Example 1 (48.5 parts) was added a phthalo blue pigment base (17.3 parts), a yellow pigment base (21.0 parts), a black pigment base (2.8 parts) and a white pigment base (10.4 parts). The viscosity of the resulting ink composition was 47 while the ink was fresh (measured with a #2 Signature cup). The viscosity after the ink was aged at 50°C for 7 days was 90.

Example 16

- 25 To the blend vehicle of Example 2 (48.2 parts) was added a phthalo blue pigment base (16.4 parts), a yellow pigment base (20.0 parts), a black pigment base (2.8 parts) and a white pigment base (9.6 parts). The viscosity of the resulting ink composition was 35 while the ink was fresh (measured with a #2 Signature cup). The viscosity after the ink was aged at 50°C for 7 days was 45.

Example 17 (Comparative Standard Vehicle)

- 30 To the blend vehicle of Example 1 (80.0 parts) was added a yellow pigment base (40.0 parts). The viscosity of the resulting ink composition was 47 while the ink was fresh (measured with a #2 Signature cup). The viscosity after the ink was aged at 50°C for 7 days was 204.

Example 18 (w/ urea)

- 35 To the blend vehicle of Example 2 (57.0 parts) was added a yellow pigment base (38.0 parts) and urea (5.0 parts). The viscosity of the resulting ink composition was 35 while the ink was fresh (measured with a #2 Signature cup). The viscosity after the ink was aged at 50°C for 7 days was 59.

- 40 The foregoing examples are not intended to be limiting. Other examples and applications will be apparent to persons of skill in the art. The scope of the invention is

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- 5 established by the following set of claims. Unless otherwise noted, all percentages, ratios and parts provided herein are based on weight or weight percent (wt. %) and are based on the weight of either the blend vehicle or the printing ink composition.

5 We claim:

1. A viscosity stabilizing blend vehicle for use in preparing water based flexographic printing inks, said vehicle comprising:

- 10 a. a styrenated acrylic polymer having a glass transition temperature (T_g) of about 48 °C to about 52 °C, and an acid number of about 65 to about 75;
b. an acetylene diol surfactant having an HLB value between 3 and 10; and
c. a silicone based de-foaming agent.

15 2. The blend vehicle of claim 1 wherein the styrenated acrylic polymer is in the form of an emulsion.

3. The blend vehicle of claim 1 having about 74 wt. % to about 84 wt. % styrenated acrylic polymer; 0.8 wt. % to about 1.2 wt. % acetylene diol surfactant; about 0.15 wt. % to about 25 wt. % silicone based de-foaming; and up to about 0.25 wt. % water.

20 4. The blend vehicle of claim 1 further comprising a polyethylene wax.

5. The blend vehicle of claim 4 wherein the polyethylene wax is selected from micronized polyethylene waxes and combinations thereof.

25 6. The blend vehicle of claim 5 having from about 4.5 wt. % to about 5.5 wt. % polyethylene wax.

7. The blend vehicle of claim 1 further comprising urea or a urea derivative.

30 8. The blend vehicle of claim 7 wherein the urea or urea derivative is selected from the group consisting of urea, methyl urea, or ethyl urea.

9. The blend vehicle of claim 8 having up to about 10 wt. % urea or urea derivative.

35 10. The blend vehicle of claim 1 further comprising a polyhydric alcohol.

11. The blend vehicle of claim 10 wherein the polyhydric alcohol is sorbitol.

12. The blend vehicle of claim 11 having up to about 10 wt. % sorbitol.

40 13. The blend vehicle of claim 10 further comprising urea or urea derivatives.

14. A viscosity stabilized water based flexographic printing ink composition comprising:

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5 a viscosity stabilizing blend vehicle made of :

- I a styrenated acrylic polymer having a glass transition temperature (T_g) of about 48 °C to about 52 °C, and an acid number of about 65 to about 75,
- II an acetylene diol surfactant having an HLB value between 3 and 10,
- 10 and
- III a silicone based de-foaming agent;

in combination with at least one aqueous based pigment dispersion.

15 15. The ink composition of claim 14 having about 35 wt. % to about 65 wt. % blend vehicle and about 35 wt. % to about 65 wt. % aqueous based pigment dispersion.

18. The ink composition of claim 14, wherein the pigment colorant portion of the aqueous based pigment dispersion is selected from the group consisting of : PW 6, PY 14, PY 3, PO 5, PO 16, PR 49:1, PR 49:2, PO 46, PR 2, PR 23, PR 57:1, PP 166, PV 1, PB 15:3, PB 16, PB 61, 20 PV 27, PV 23, PV 3, PG 7, PB 7, and combinations thereof.

17. The ink composition of claim 16 wherein the pigment is in the form of a presscake, a dry power, or a flush.

25 18. The ink composition of claim 14 wherein the water based pigment dispersion is selected from the group consisting of: PMA140, PMA220, PMA221, PMA22, PMA320, PMA400, PMA405, PMA460, PMA466, PMA467, PMA525, PMA526, PMA602, PMA604, PMA720, PMA900, PMA950, PMA980, PMA990, PMA325, PMA324, PMA462, PMA464, PMA466, PMA468, PMA469, PMA530, PMA542, PMA600 and combinations thereof.

30 19. The ink composition of claim 14 further comprising a polyethylene wax.

20. The ink composition of claim 14 further comprising urea or urea derivatives.

35 21. The ink composition of claim 20 wherein the urea or urea derivatives is selected from the group consisting of urea, methyl urea, or ethyl urea.

22. The ink composition of claim 20 further comprising a polyhydric alcohol.

40 23. The ink composition of claim 22 wherein the polyhydric alcohol is sorbitol.

24. The ink composition of claim 14 further comprising polyhydric alcohol.

24

5 25. The ink composition of claim 24 wherein the polyhydric alcohol is sorbitol.

26. A viscosity stabilized water based flexographic printing ink composition comprising:
a viscosity stabilizing blend vehicle made of :

- 10 I RLS-B62 styrenated acrylic polymer,
 II Surfynol 104H acetylene diol surfactant,
 III Dee Fo PI-40 silicone based defoaming agent,
 IV sorbitol, and
 V urea;

In combination with at least one aqueous based pigment dispersion.

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VEHÍCULOS DE MEZCLA ESTABILIZANTE DE VISCOSIDAD PARA
PREPARAR TINTAS DE IMPRESIÓN FLEXOGRÁFICAS BASADAS EN
AGUA

Campo De La Invención

Esta invención se relaciona con el campo de los vehículos de tinta de impresión útiles para preparar tintas de impresión flexográfica basadas en agua. Más específicamente, la invención se relaciona van mejorar la estabilidad de la viscosidad en almacenamiento de largo plazo de tales tintas de impresión al utilizar tales vehículos y los aditivos modificantes de reología que mejoran el brillo de la tinta y la resistencia del color.

Antecedentes De La Invención

Las tintas de impresión para sistemas de impresión flexográficas son bien conocidas en la técnica. En años recientes, ha existido una tendencia constante a utilizar tintas de impresión flexográfica basadas en agua para eliminar o al menos minimizar, los problemas ambientales y de salud asociados con el uso de compuestos orgánicos

volátiles (VOCs) contenidos en las tintas de impresión flexográficas convencionales que son liberada en los salones de prensa y la atmósfera. Aunque numerosas formulaciones de tinta de impresión basadas en agua han sido desarrolladas estas tintas han exhibido generalmente pobre estabilidad de la viscosidad en almacenamientos a largo plazo. Específicamente, al envejecer, la viscosidad en almacenamiento de tales tintas se incrementa significativamente, hasta el punto en que ocurre la gelificación completa de la tinta. Esto origina problemas severos tanto para los fabricantes de tinta de impresión como los impresores que utilizan las tintas. El problema es particularmente severo para imprimir tintas que emplean pigmentos amarillo, rojo, o naranja. De acuerdo con esto, existe necesidad de tintas de impresión flexográfica basadas en agua, especialmente aquellas que incorporan pigmentos amarillo, rojo o naranja, que tienen buena estabilidad de viscosidad en almacenamientos a largo plazo.

En el campo de las tintas de impresión, también es deseable ser capaz de preaparta una variedad de tinta flexográficas basadas en agua de un amplio rango de pigmentos, de una manera rápida eficiente y económica.



Una forma de hacer esto es suministrar un vehículo (es decir vehículo de mezcla para la tinta de impresión que contiene substancialmente todos los componentes necesarios para la composición de tinta de impresión final. Esto incluiría agentes de modificación reológicos y aditivos resistentes al caucho. Para formular la composición de tinta de impresión de esta manera el pigmento, usualmente agregado como una dispersión de pigmento basado en agua, es todo el que se requiere. El pigmento o la dispersión de pigmento basada en agua se agrega en el vehículo de mezcla es un proceso de mezcla relativamente simple, usualmente de etapa sencilla para formular la composición de la tinta de impresión. En razón a que el vehículo de mezcla se prepara en una etapa separada, un vehículo de mezcla generalizado para uso con una variedad de dispersiones de pigmento basadas en agua se pueden preparar por adelantado y almacenar. De esta manera un gran número de composiciones de tinta de impresión se pueden preparar de un vehículo de mezcla común, con ciertos otros componentes específicos a un pigmento particular de la dispersión de pigmento acuoso que es agregada en la etapa de mezcla o ajustes a la composición de ciertos componentes del vehículo de mezcla se pueden hacer en la etapa de mezcla. Alternativamente,

los vehículos de mezcla acostumbrados para uso con pigmentos específicos o dispersiones de pigmento con base acuosa se pueden preparar y almacenar permitiendo que una tinta de impresión de un color particular sea preparada rápida y eficientemente utilizando un vehículo especialmente de mezcla.

Nosotros hemos descubierto que la incorporación y uso de ciertos vehículos de mezcla de la preparación de tintas de impresión flexográficas basadas en agua pueden mejorar notoriamente la estabilidad de la viscosidad en almacenamientos a largo plazo en la tinta, especialmente cuando las dispersiones de pigmentos amarillo, rojo, o naranja mas complicados y los pigmentos con base acuosa son utilizados para formular la tinta. De acuerdo con esto, nosotros hemos desarrollado composiciones de tinta de impresión flexográfica basada en agua en la cual se incorporan estos vehículos de mezcla. Nosotros también hemos descubierto que la estabilidad de la viscosidad en almacenamiento a largo plazo de estas tintas pueden ser mejoradas mediante la adición de ciertos modificadores de reología. Como beneficio, nosotros también hemos descubierto que la adición ulterior de estos modificadores pueden tener un efecto benéfico adicional

sobre ciertas otras propiedades de la tinta, las cuales incluyen pero no están limitadas a, brillo y resistencia al color.

Resumen De La Invención

La invención es un vehículo de mezcla estabilizante de viscosidad para almacenamiento a largo plazo para uso de la preparación de composiciones de tinta de impresión flexográfica basadas en agua con viscosidad estable: (a) un polímero acrílico estirenado que tiene una temperatura de transición vítrea (T_g) de aproximadamente 18° C a aproximadamente 52° C y un número ácido de aproximadamente 65 a aproximadamente 75; (b) un tensoactivo de diol acetileno que tiene un valor de HLB entre 3 y 10; y (c) un agente des-espumante basado en silicona.

En otro aspecto, la invención es una composición de tinta de impresión flexográfica basada en agua de viscosidad estable preparada utilizando el vehículo de mezcla de la presente invención y pigmentos convencionales o dispersiones de pigmento basadas en agua

utilizadas para formular las tintas de impresión flexográfica.

Descripción Detallada de la Invención

Los vehículos de mezcla para las tintas de impresión flexográfica asadas en agua de la presente invención incorporan un polímero acrílico estirenado, que tiene una temperatura de transición vítrea (T_g) de aproximadamente 48° C a aproximadamente 52° C. Y un número ácido de aproximadamente 65 a aproximadamente 75. El polímero estirenado es preferiblemente utilizado en una cantidad desde aproximadamente 74% en peso a aproximadamente 84% en peso basados en el peso del vehículo de mezcla.

El vehículo de mezcla también incorpora un tensoactivo de acetileno diol que tiene un valor HLB entre 3 y 10. El HLB o balance hidrofílico/lipofílico del tensoactivo representa la adecuabilidad del tensoactivo a estabilizar una emulsión del tipo de macro emulsión (opaca, tamaño de partícula > 400 nm, estabilidad baja) y/o el tipo de micro emulsión (ópticamente clara, termodinámicamente estable, tamaño de partícula < 100 nm).. Un valor HLB de 20 es asignado, por

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ejemplo, para tensoactivos no iónicos del tipo etoxilado que contienen unidades de óxido de etileno completas y un valor HLB de 0 es asignado a los productos completamente insolubles en agua que no contienen fragmentos de óxido de etileno. La mayoría de los valores HLB caen entre estos dos números. Una relación empírica para llegar a los valores HLB es $[HLB = \frac{\% \text{ de grupos hidrofílicos (molar)}}{5}]$. El tensoactivo empleado en la presente invención sirve para mejorar la humectación del pigmento por el agua al disminuir la tensión interfacial, facilitar el proceso mecánico, y estabilizar la dispersión basada en agua al controlar la floculación de partículas. Un tensoactivo particularmente preferido encontrado por ser más estable para preparar los vehículos de mezcla de la presente invención es un tensoactivo no iónico. El Surfynol 104 (Surfynol es una mezcla registrada y un producto de Air Products Corporation, Allentown, PA) basados en una porción de hidrocarburo modificada por química de acetileno y muestra un desempeño superior en composiciones basadas en agua. Los vehículos de mezcla de acuerdo con la presente invención, pueden adicionalmente incluir un segundo tensoactivo, que es diferente del tensoactivo de acetileno diol. El tensoactivo de acetileno diol es

preferiblemente utilizado en una cantidad de aproximadamente 0,8% en peso a aproximadamente 1,2% en peso basado en el peso del vehículo de mezcla.

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Los vehículos de mezcla de la presente invención también requieren el uso de un agente des-espumante basado en silicona que es preferiblemente en una cantidad desde aproximadamente 0,15% en peso a aproximadamente 0,25% en peso basados en el peso del vehículo de mezcla. El vehículo de mezcla de acuerdo con la presente invención, puede adicionalmente incluir un segundo agente des-espumante, que es diferente del agente des-espumante basado en silicona.

Se ha descubierto que el uso de polímeros acrílicos estirenados del tipos descrito anteriormente mejoran grandemente la estabilidad de la viscosidad de las tintas de impresión flexográficas preparados con vehículos de mezcla de la presente invención sobre tintas de impresión formuladas con vehículos de mezcla estándar o convencionales formulados sin tales componentes.

Además, el efecto estabilizante sobre la viscosidad de los vehículos de mezcla que preparan las composiciones

de tintas de impresión flexográfica basadas en agua de la presente invención se mejoran adicionalmente al incorporar al menos., y preferiblemente una combinación de una urea o un derivado de urea tal como urea, metil urea, o etil urea y alcohol polihídrico (Por ejemplo, sorbitol). Cada uno actúa como modificador de reología y, junto con el polímero acrílico estirenado, suministra una mejora sinérgica e inesperada adicional en la estabilización de la viscosidad. La urea cuando está presente se utiliza en hasta aproximadamente 10% en peso con base en el peso del vehículo de mezcla. El alcohol polihídrico o el sorbitol, cuando están presentes se utilizan en una cantidad de hasta aproximadamente 10% en peso con base en el peso del vehículo de mezcla. Esto se ilustra en la tabla 1 adelante.

Una modalidad preferida del vehículo de mezcla de la presente invención incluiría una cera o compuesto de cera tal como cera de polietileno, que actúa no suministrando resistencia a la composición de tinta de impresión final. Una cera o compuesto de cera, cuando está presente se utiliza en una cantidad hasta de 5% en peso con base en el peso del vehículo de mezcla.

Las composiciones de tinta de impresión flexográficas basadas en agua preparados de acuerdo con la invención son formuladas al agregar al menos un pigmento cuando es típicamente suministrado en la forma de una dispersión de pigmento acuoso. La dispersión típicamente tiene un contenido de sólidos (pigmentos) de aproximadamente 15% en peso a aproximadamente 45% en peso con base en el peso total de la dispersión. El contenido de agua de la composición de tinta de impresión de la presente invención se deriva de la porción acuosa del polímetro acrílico estirenado de la porción acuosa de la dispersión de pigmentos basada en agua o ambos. La cantidad de agua presente es de hasta de 205 en peso con base en el peso de la composición de tinta.

En formulaciones de composiciones de tinta de impresión flexográfica basada en agua de vehículos de mezcla, de acuerdo con la presente invención, una dispersión basada en agua, en una cantidad desde aproximadamente de 35% en peso a aproximadamente 65% en peso con base en el peso de la composición de tinta, se mezcla con el vehículo de mezcla. El vehículo de mezcla se agrega en una cantidad desde aproximadamente 35% en peso a aproximadamente 65% en peso basados en el peso de

la composición de tinta. Incrementos especialmente significativos en la estabilidad de la viscosidad a largo plazo se han logrado mediante la mezcla de los vehículos de la presente invención cuando se utilizan para formular tintas de impresión flexográfica basadas en agua que emplean pigmentos amarillo, rojo, y naranja y dispersiones de pigmentos con base acuosa.

Tabla 1

Tintas Flexográficas hechas de Varios Vehículos de mezcla

	Estándar (Ejemplo 4)	Ejemplo 5	Ejemplo 6 (w/urea)	Ejemplo 7 (w/sorbi- tol)
Viscosidad Inicial (copa Signature #3)	45	29	18	17
Viscosidad 7 días (copa Signature #3)	180	65	48	39
Brillo (SBS)	54	70	70	69
Brillo (Kemiart Lite)	19	26	27	26
Resistencia al Color (SBS)	Estándar	Más fuerte	Más fuerte	Más Fuerte

Otras dispersiones de pigmento acuoso adecuadas para el uso de la preparación de composiciones de tinta de impresión flexográfica basadas en agua de los vehículos de la presente invención se establecen adelante en la tabla 2.

Tabla 2

Base	Pigmento	Color	Índice de color	Fabricante
PMA140	Blanco	Blanco	PW 6	Sun Chemical
PMA220	Amarillo AAOT	Amarillo	PY 14	Sun Chemical
PMA221	Amarillo AAOT	Amarillo	PY 14	Sun Chemical
PMA222	Amarillo	Amarillo	PY 3	Sun Chemical
PMA320	Naranja	Naranja	PO 5	Sun Chemical
PMA324	Naranja	Naranja	PO 16	Heucotech
PMA325	Naranja	Naranja	PO 16	Drew
PMA400	Litol	Rojo	PR 49:1	Sun Chemical
PMA405	Litol	Rojo	PR 49:2	Sun Chemical
PMA460	Clarion	Naranja	PO 48	Sun Chemical
PMA462	Naftol	Rojo	PR 2	Heucotech
PMA464	Naftol	Rojo	PR 23	Heucotech
PMA466	Rubino	Rojo	PR 57:1	Heucotech
PMA466	Rubino	Rojo	PR 57:1	Sun Chemical
PMA467	Rubino	Rojo	PR 57:1	Sun Chemical
PMA468	Rodamino	Púrpura	PR 169	Heucotech
PMA469	Rodamino	Violeta	PV 1	Heucotech
PMA525	Azul	Azul	PB 15:3	Sun Chemical
PMA526	Azul	Azul	PB 15:3	Sun Chemical
PMA530	Azul	Azul	PB 16	Heucotech
PMA542	Azul	Azul	P 61	Heucotech
PMA600	Violeta	Violeta	PV 27	Heucotech
PMA602	Violeta	Violeta	PV 23	Sun Chemical
PMA604	Violeta	Violeta	PV 3	Sun Chemical
PMA720	Verde	Verde	PG 7	Sun Chemical
PMA900	Negro	Negro	PB 7	Sun Chemical
PMA950	Negro	Negro	PB 7	Sun Chemical
PMA980	Negro	Negro	PB 7	Sun Chemical
PMA990	Negro	Negro	PB 7	Sun Chemical

Además, otros pigmentos y dispersiones de pigmento pueden ser utilizadas para preparar composiciones de tinta de impresión flexográficas basadas en agua de acuerdo con la presente invención incluyen : dispersiones de rojo tales como RCD-0572 Lithol Rubine y RC-8135 Naphthol V/S, fabricado por Sun Chemical Corporation, Fort Lee, New Jersey; dispersiones naranja tales como OS-8088 Naranja, fabricadas por Sun Chemical Corporation; y dispersiones blancas tales como PMA 140, fabricadas por Sun Chemical Corporation.

La porción colorante del vehículo de las dispersiones de pigmento con base acuosa al ser mezcladas con el vehículo de la presente invención se pueden utilizar individualmente o en combinación con otros pigmentos. El pigmento puede estar en la forma de una torta de prensa, polvo seco o fluido. Ejemplos de pigmentos adecuados son descritos o referenciados aquí por en índice de color No. e incluyen PY 14 (AAOT amarillo), PO 16 (Dianisdine Naranja), PR 23 (BS Naftol), PR 57:1, Hs Litho, Rubine, PB 15:3 (Phthalo azul), y PV 23 (Carbazol Violeta).

Será entendible fácilmente por personas medianamente versadas en la materia técnica que de acuerdo con la presente invención es usualmente prepara un vehículo de mezcla separada para el uso subsecuente en la preparación de composiciones de tinta basadas en agua que tiene estabilidad de viscosidad mejorada, la presente invención también comprende la preparación de composiciones de tinta basadas en agua final, que tiene todos los compuestos citados, directamente de los componentes sin la preparación separada del vehículo de mezcla.

La preparación de los vehículos de mezclas y las composiciones de tinta de impresión flexográfica basadas en agua de acuerdo con la presente invención se establece en los ejemplos de adelante. En los siguientes ejemplos, cualquiera "parte" o proporciones están basadas en el peso a menos que se especifique otra cosa.

Ejemplo 1 (Vehículo Estándar Compatible)

Un polímero acrílico (84 partes de Lucidene 612, "Lucidene" es una marca registrada de Rohm & Haas de Filadelfia, PA) se agregó a un aditivo de cera de polietileno (5 partes de 59 K-21PE, un producto

comercialmente disponible de Sun Chemical), un tensoactivo de acetileno diol (2 partes de Ex 649-68 de Sun Chemical), y un des-espumante (1,2 partes de DeeFo 3010E/50, "DeeFo" siendo una marca de Ultra Additives, Inc of Paterson, NJ) con el balance de la formulación esta siendo agua. El vehículo de mezcla formado así tiene un pH de 9,1.

La viscosidad de masa inicial del vehículo de mezcla y las tintas de impresión de la presente invención se midieron al medir la cantidad de tiempo en segundos necesaria para que el vehículo de muestra fluyera completamente afuera de la Signature Cup #2 indicada. De acuerdo con la medición anterior el vehículo de mezcla tuvo una viscosidad de masa medida de 36 segundos.

Ejemplo 2

A un polímero acrílico estirenado (84 partes de Parachem RLS-B62) se agregó un aditivo de cera de polietileno (5 partes de 59 K-21PE), un tensoactivo de acetileno diol (1 parte de Surfynol 104H de Air Products), y un des-espumante (0,2 partes de DeeFo PI-40 de Ultra) con el balance de la formulación esta siendo

agua (9,8 partes). El vehículo de mezcla formado así tiene un pH de 9,1. De acuerdo con el método anterior la medición de la viscosidad de masa, el vehículo de mezcla tuvo una viscosidad de 45 segundos.

Ejemplo 3 (w/urea y sorbitol)

A un polímero acrílico estirenado (74 partes de Parachem RLS-B62) se agregó un aditivo de cera de polietileno (5 partes de 59 K-21PE), un tensoactivo de acetileno diol (1 parte de Surfynol 104H de Air Products), y un des-espumante (0,2 partes de DeeFo PI-40 de Ultra), urea (10 partes) y sorbitol (5 partes) con el balance de la formulación siendo agua (4,8 partes). El vehículo de mezcla así formado tuvo un pH de 8,1. De acuerdo con el método anterior de medición de la viscosidad de masa, el vehículo de mezcla tuvo una viscosidad de 20 segundos.

Ejemplo 4

El vehículo de mezcla del ejemplo 1 (40,0 partes) se agregó a una base de pigmento rojo naftol (5,6 partes), una base de pigmento naranja (53,4 partes) y glicol éter

(1,00 partes). La viscosidad de la composición de tinta resultante fue de 45 mientras que la tinta estuvo fresca (medida con una Copa Signature #3). El brillo se midió sobre el sustrato SBS y fue 54. Y sobre el Kemiart-Lite como 19. La resistencia al color se midió visualmente sobre SBS y se calificó como estándar.

La estabilidad de la viscosidad de la composición de tinta se midió como sigue: 100 gramos de tinta se ubicaron en un jarro de 4 onzas y se cerró la tapa. El jarro que contiene tinta es entonces ubicado en un horno a 50° C. Después de 7 días la tinta es removida del horno, se le permite llegar a temperatura ambiente de cuarto y revisar la flotación y solidificación. Es entonces mezclada durante 5 minutos y revisada su viscosidad. La viscosidad de la composición de tinta del ejemplo 3 después de ser envejecida 7 días a 50° C fue 180.

Ejemplo 5

Al vehículo de mezcla del ejemplo 2 (40,0 partes) se agregó una base de pigmento rojo naftol (5,6 partes), una base de pigmento naranja (53,4 partes) y glicol éter

(1,00 partes). La viscosidad de la composición de tinta resultante fue de 29 mientras que la tinta estuvo fresca (medición con una Copa Signature #3). El brillo se midió sobre sustrato SBS y fue 54, y sobre sustrato Kemiart-Lite fue 19. La resistencia del color se midió sobre un sustrato SBS y se calificada visualmente como más fuerte que la tinta hecha con el estándar. La viscosidad de la composición de tinta del ejemplo 3 después de ser envejecida 7 días a 50° C fue 65.

Ejemplo 6 (w/urea)

A la composición de tinta del Ejemplo 4 se le agregó urea (5 partes en peso). La viscosidad de la tinta fresca fue 18, el brillo SBS fue 70, el brillo Kemiart-Lite fue 27, y la resistencia de color sobre SBS fue más fuerte. La viscosidad de la tinta después de ser envejecida cinco días a 50° C fue de 48.

Ejemplo 7 (w/sorbitol)

A la composición de tinta del Ejemplo 4 se le agregó sorbitol (5 partes en peso). La viscosidad de la tinta fresca fue 17, el brillo SBS fue 69, el brillo Kemiart-

Lite fue 26, y la resistencia al color sobre SBS fue más fuerte. La viscosidad de la tinta después de ser envejecida cinco días a 50° C fue de 39.

Ejemplo 8

Al vehículo de mezcla del ejemplo 1 (63,0 partes) se le agregó una base de pigmento azul ftalo (24 partes), una base de rubino litol (3,5 partes) una base de pigmento negro (1,5 partes) y una base de pigmento blanco (8,0 partes). La viscosidad de la composición de tinta resultante fue de 37 mientras que la tinta estaba fresca (medida con una Copa Signature #2). La viscosidad después de que la tinta se envejeció a 50° C durante 7 días fue 60.

Ejemplo 9

Al vehículo de mezcla del ejemplo 2 (60,0 partes) se agregó una base de pigmento azul ftalo (23 partes), una base de rubino litol (3,0 partes), una base de pigmento negro (1,4 partes) y una base de pigmento blanco (7,6 partes). La viscosidad de la composición de tinta resultante fue de 30 mientras que la tinta estuvo fresca

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(medida con una copa Signature #2). La viscosidad después de que la tinta se envejeció a 50° C durante 7 días fue 33.

Ejemplo 10

Al vehículo de mezcla del ejemplo 1 (35,05 partes) se agregó una base de pigmento rubino litol (32 partes), una base de pigmento naftol (13,65 partes) una base de pigmento naranja (14,3 partes) y una base de pigmento blanco (5,0 partes). La viscosidad de la composición de tinta resultante fue de 38 mientras que la tinta estuvo fresca (medida con una copa Signature #2). El brillo se midió sobre un sustrato SBS y fue 48 y sobre el Kemiart-Lite fue 33. La resistencia al color se midió visualmente sobre el SBS y se calificó como estándar.

Ejemplo 11 (porcentaje de urea y sorbitol)

Al vehículo de mezcla del ejemplo 3 (35,05 partes) se le agregó una base de pigmento rubino litol (32 partes), una base de pigmento naftol (13,65 partes) una base de pigmento naranja (14,3 partes) y una base de pigmento blanco (5,0 partes). La viscosidad de la

composición de tinta resultante fue de 28 mientras que la tinta estuvo fresca (medida con una copa Signature #2). El brillo se midió sobre un sustrato SBS y fue 54 y sobre el Kemiart-Lite fue 36. La resistencia al color se midió visualmente sobre el SBS y se calificó como más fuerte.

Ejemplo 12

Al vehículo de mezcla del ejemplo 1 (35,05 partes) se le agregó una base de pigmento rubino litol (32 partes), una base de pigmento naftol (13,65 partes), una base de pigmento naranja (14,3 partes) y una base de pigmento blanco (5,0 partes). La viscosidad de la composición de tinta resultante fue de 41 mientras que la tinta estuvo fresca (medida con una copa Signature #2). La tinta fue envejecida durante 5 días a 50° C días y la viscosidad resultante fue 115.

Ejemplo 13 (w/urea)

Al vehículo de mezcla del ejemplo 1 (35,05 partes) se le agregó una base de pigmento rubino litol (32 partes), una base de pigmento naftol (13,65 partes), una base de pigmento naranja (14,3 partes), una base de

pigmento blanco (5,0 partes) y urea (5 partes). La viscosidad de la composición de tinta resultante fue de 21 mientras que la tinta estuvo fresca (medida con una copa Signature #2). La tinta fue envejecida durante 5 días a 50° C días y la viscosidad resultante fue 75.

Ejemplo 14 (Vehículo Estándar Comparativo w/sorbitol)

Al vehículo de mezcla del ejemplo 1 (35,05 partes) se le agregó una base de pigmento rubino litol (32 partes), una base de pigmento naftol (13,65 partes), una base de pigmento naranja (14,3 partes), una base de pigmento blanco (5,0 partes) y sorbitol (5 partes). La viscosidad de la composición de tinta resultante fue de 22 mientras que la tinta estuvo fresca (medida con una copa Signature #2). La tinta se envejeció durante 5 días a 50° C días y la viscosidad resultante fue 90.

Ejemplo 15 (Vehículo Estándar Comparativo)

Al vehículo de mezcla del ejemplo 1 (44,5 partes) se agregó una base de pigmento azul ftalo (17,3 partes), una base de pigmento amarillo (21 partes), una base de pigmento negro (28 partes) y una base de pigmento blanco

(10,4 partes). La viscosidad de la composición de tinta resultante fue de 47 mientras que la tinta estuvo fresca (medida con una copa Signature #2). La viscosidad después de que la tinta se envejeció a 50° C durante 7 días fue 90.

Ejemplo 16

Al vehículo de mezcla del ejemplo 2 (46,2 partes) se le agregó una base de pigmento azul ftalo (16,4 partes), una base de pigmento amarillo (20,0 partes), una base de pigmento negro (2,6 partes) y una base de pigmento blanco (9,8 partes). La viscosidad de la composición de tinta resultante fue de 35 mientras que la tinta estuvo fresca (medida con una copa Signature #2). La viscosidad después de que la tinta se envejeció a 50° C durante 7 días fue 45.

Ejemplo 17 (Vehículo Estándar Comparativo)

Al vehículo de mezcla del ejemplo 1 (60,0 partes) se le agregó una base de pigmento amarillo (40,0 partes). La viscosidad de la composición de tinta resultante fue de 47 mientras que la tinta estuvo fresca (medida con una



copa Signature #2). La viscosidad después de que la tinta se envejeció a 50° C durante 7 días fue 204.

Ejemplo 18 (w/urea)

Al vehículo de mezcla del ejemplo 2 (57,0 partes) se le agregó una base de pigmento amarillo (38,0 partes) y urea (5,0 partes). La viscosidad de la composición de tinta resultante fue de 35 mientras que la tinta estuvo fresca (medida con una copa Signature #2). La viscosidad después de que la tinta se envejeció a 50° C durante 7 días fue 59.

Los ejemplos anteriores no pretenden ser limitantes. Otros ejemplos y aplicaciones serán evidentes para las personas expertas en la técnica. El alcance de la invención se establece por el siguiente grupo de reivindicaciones. A menos que se establezca o que se anote otra cosa las proporciones en porcentaje y las partes suministradas aquí están basadas en el peso o porcentaje en peso (p. %) y está basada en el peso de vehículo de mezcla o la composición de tinta de impresión.

REIVINDICACIONES

1. Un vehículo de mezcla estabilizante de viscosidad para uso en la preparación de tintas de impresión flexográfica basadas en agua, dicho vehículo comprende:

a. Un polímero acrílico estirenado que tiene una temperatura de transición vítrea (T_g) de aproximadamente 48° C a aproximadamente 52° C y un número ácido de aproximadamente 65 a aproximadamente 75.

b. Un tensoactivo de acetileno diol que tiene un valor HLB entre 3 y 10, y

c. Un agente des-espumante basado en silicona.

2. El vehículo de mezcla de la reivindicación 1 en donde el polímero acrílico estirenado está en la forma de una emulsión.

3. El vehículo de mezcla de la reivindicación 1 que tiene aproximadamente 74% en peso a aproximadamente 84% en peso del polímero acrílico estirenado; 0,8% en peso a aproximadamente 1,2% en peso de tensoactivo de acetileno diol; aproximadamente 0,15% en peso a aproximadamente 25%

en peso de des-espumante basado en silicona; y asta aproximadamente 0,25% de agua.

4. El vehículo de mezcla de la reivindicación 1 que comprende además una cera de polietileno.

5. El vehículo de mezcla de la reivindicación 4 en donde la cera de polietileno se selecciona de ceras de polietileno micronizadas y combinaciones de estas.

6. El vehículo de mezcla de la reivindicación 5 que tiene desde aproximadamente 4,5% en peso a aproximadamente 5,5% en peso de cera de polietileno.

7. El vehículo de mezcla de la reivindicación 1 que más comprende urea y un derivado de urea.

8. El vehículo de mezcla de la reivindicación 7 en donde la urea o el derivado de urea se selecciona del grupo que consiste de urea, metil urea, o etil urea.

9. El vehículo de mezcla de la reivindicación 8 que tiene hasta aproximadamente 10% en peso de urea o un derivado de urea.

10. El vehículo de mezcla de la reivindicación 1 que comprende además un alcohol polihídrico.

11. El vehículo de mezcla de la reivindicación 10 en donde el alcohol polihídrico es sorbitol.

12. El vehículo de mezcla de la reivindicación 11 que tiene hasta aproximadamente 10% en peso de sorbitol

13. El vehículo de mezcla de la reivindicación 10 que comprende además urea y derivados de urea.

14. Una composición de tinta de impresión flexográfica basada en agua de viscosidad estabilizada que comprende:
Un vehículo estabilizante de viscosidad hecho de:

I. Un polímero acrílico estirenado que tiene una temperatura de transición vítrea (T_g) de aproximadamente 48° C a aproximadamente 52° C y un número ácido de aproximadamente 65 a aproximadamente 75.

II. Un tensoactivo de acetileno diol que tiene un valor HLB entre 3 y 10, y

III. Un agente des-espumante basado en silicona.

En combinación con al menos una dispersión de pigmento con base acuosa.

15. La composición de tinta de la reivindicación 14 que tiene aproximadamente 35% en peso a aproximadamente 65% en peso de un vehículo de mezcla y aproximadamente 35% en peso a aproximadamente 65% en peso de dispersión de pigmento con base acuosa.

16. La composición de tinta de la reivindicación 14 en donde la porción de colorante de pigmento de la dispersión de pigmento con base acuosa se selecciona del grupo que consiste de : PW 6, PY 14, PY 3, PO 5, PO 16, PR 49:1, PR 49:2, PO 46, PR 2, PR 23, PR 57:1, PP 169, PV 1, PB 15:3, PB 16, PB 61, PV 27, PV 23, PV 3, PG 7, PB 7, y combinaciones de estos.

17. La composición de tinta de la reivindicación 16 en donde el pigmento está en la forma de una torta de prensa, un polvo seco, o un fluido.

18. La composición de tinta de la reivindicación 14 en donde la dispersión de pigmento basado en agua se selecciona del grupo que consiste de: PMA140, PMA220,

PMA221, PMA222, PMA320, PMA400, PMA405, PMA460, PMA466, PMA467, PMA525, PMA526, PMA602, PMA604, PMA720, PMA900, PMA950, PMA980, PMA990, PMA325, PMA 324, PMA462, PMA464, PMA 466, PMA468, PMA469, PMA530, PMA542, PMA600 y combinaciones de estos.

19. La composición de tinta de la reivindicación 14 que comprende además una cera de polietileno.

20. La composición de tinta de la reivindicación 14, que comprende además urea o derivados de urea.

21. La composición de tinta de la reivindicación 20 en donde la urea o los derivados de urea se seleccionan del grupo que consiste de urea, metil urea o etil urea.

22. La composición de tinta de la reivindicación 20, que comprende además un alcohol polihídrico.

23. La composición de tinta de la reivindicación 22 en donde el alcohol polihídrico es sorbitol.

24. La composición de tinta de la reivindicación 14 que comprende además alcohol polihídrico.

25. La composición de tinta de la reivindicación 14, en donde el alcohol polihídrico es sorbitol.

26. Una composición de tinta de impresión flexográfica basada en agua con viscosidad estabilizada que comprende:

Un vehículo de mezcla estabilizante de viscosidad hecho:

I. Polímero acrílico estirenado RLS-B62,

II. Tensoactivo de acetileno díol 104H Surfynol

III. Agente des-espumante basado en silicona DeeFo

PI-40,

IV. sorbitol, y

V. urea;

En combinación con al menos una dispersión de pigmento con base acuosa.

RESUMEN

Un vehículo de mezcla estabilizante de viscosidad para almacenamiento a largo plazo para tintas de impresión flexográfica basadas en agua que tiene un polímero acrílico estirenado, un tensoactivo de acetileno diol, y un agente des-espumante basado en silicona. El vehículo de mezcla comprende además al menos una reología que modifica la urea y/o el sorbitol que además mejora la estabilidad a la viscosidad.

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 Applicant"

Applicant's or agent's file reference
(if desired) (12 characters maximum) C-538

Box No. I TITLE OF INVENTION
VISCOSITY STABILIZING BLEND VEHICLES FOR PREPARING WATER BASED FLEXOGRAPHIC PRINTING INKS

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.)

SUN CHEMICAL CORPORATION
222 Bridge Plaza South
Fort Lee, New Jersey 07024
United States of America

Telephone No.
201-224-4600

Facsimile No.
201-224-2439

Teleprinter 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)

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.)

SPRYCHA, Raymond
2 Hillside Terrace
Wallington, New Jersey 07057
United States of America

This person is:

☐ applicant only

☒ applicant and inventor

☐ inventor only (if this check-box is marked, do not fill in below.)

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

☒ 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.)

PERSLEY, Sidney
222 Bridge Plaza South
Fort Lee, New Jersey 07024
United States of America

Telephone No.
201-224-4600

Facsimile No.
201-224-2439

Teleprinter No.

Agent's registration No. with the Office

☐ Address for correspondence: Mark this check-box where no agent or common representative has been appointed and the space above is used instead to indicate a special address to which correspondence should be sent.

Continuation of Box No. III FURTHER APPLICANTS AND/OR (FURTHER) INVENTOR(S)

If none of the following sub-boxes is used, this sheet should not be included in the request.

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.)

LEDA, More
178 Mehrhof Road
Little Ferry, New Jersey 07643
United States of America

This person is:

- ☐ applicant only
☒ applicant and inventor
☐ inventor only (If this check-box is marked, do not fill in below.)

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: (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.)

AUERBACH, Robert
36 Hawthorne Drive
Princeton Junction, New Jersey 08550
United States of America

This person is:

- ☐ applicant only
☒ applicant and inventor
☐ inventor only (If this check-box is marked, do not fill in below.)

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: (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.)

CATENA, Robert
78 Plenge Drive
Belleville, New Jersey 07109
United States of America

This person is:

- ☐ applicant only
☒ applicant and inventor
☐ inventor only (If this check-box is marked, do not fill in below.)

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: (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.)

This person is:

- ☐ applicant only
☐ applicant and inventor
☐ inventor only (If this check-box is marked, do not fill in below.)

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.

Box No. Y DESIGNATION OF STATES Mark the applicable check-boxes below; at least one must be marked.

The following designations are hereby made under Rule 4.9(a):

Regional Patent

- ☒ AP ARIPO Patent: GH Ghana, GM Gambia, KE Kenya, LS Lesotho, MW Malawi, MZ Mozambique, SD Sudan, SL Sierra Leone, SZ Swaziland, TZ United Republic of Tanzania, UG Uganda, ZM Zambia, ZW Zimbabwe, and any other State which is a Contracting State of the Harare Protocol and of the PCT (If other kind of protection or treatment desired, specify on dotted line)
- ☒ EA Eurasian Patent: AM Armenia, AZ Azerbaijan, BY Belarus, KG Kyrgyzstan, KZ Kazakhstan, MD Republic of Moldova, RU Russian Federation, TJ Tajikistan, TM Turkmenistan, and any other State which is a Contracting State of
- ☒ EP European Patent: AT Austria, BE Belgium, BG Bulgaria, CH & LI Switzerland and Liechtenstein, CY Cyprus, CZ Czech Republic, DE Germany, DK Denmark, EE Estonia, ES Spain, FI Finland, FR France, GB United Kingdom, GR Greece, IE Ireland, IT Italy, LU Luxembourg, MC Monaco, NL Netherlands, PT Portugal, SE Sweden, SI Slovenia, SK Slovakia, TR Turkey, and any other State which is a Contracting State of the European Patent Convention and of the PCT
- ☒ OA OAPI Patent: BF Burkina Faso, BJ Benin, CF Central African Republic, CG Congo, CI Côte d'Ivoire, CM Cameroon, GA Gabon, GN Guinea, GQ Equatorial Guinea, GW Guinea-Bissau, ML Mali, MR Mauritania, NE Niger, SN Senegal, TD Chad, TG Togo, and any other State which is a member State of OAPI and a Contracting State of the PCT (If other kind of protection or treatment desired, specify on dotted line)

National Patent (If other kind of protection or treatment desired, specify on dotted line).

- | | | |
|---|--|---|
| ☒ AE United Arab Emirates | ☒ GM Gambia | ☒ NZ New Zealand |
| ☒ AG Antigua and Barbuda | ☒ HR Croatia | ☒ OM Oman |
| ☒ AL Albania | ☒ HU Hungary | ☒ PH Philippines |
| ☒ AM Armenia | ☒ ID Indonesia | ☒ PL Poland |
| ☒ AT Austria | ☒ IL Israel | ☒ PT Portugal |
| ☒ AU Australia | ☒ IN India | ☒ RO Romania |
| ☒ AZ Azerbaijan | ☒ IS Iceland | ☒ RU Russian Federation |
| ☒ BA Bosnia and Herzegovina | ☒ JP Japan | |
| ☒ BD Barbados | ☒ KE Kenya | ☒ SC Seychelles |
| ☒ BG Bulgaria | ☒ KG Kyrgyzstan | ☒ SD Sudan |
| ☒ BR Brazil | ☒ KP Democratic People's Republic of Korea | ☒ SE Sweden |
| ☒ BY Belarus | ☒ KR Republic of Korea | ☒ SG Singapore |
| ☒ BZ Belize | ☒ KZ Kazakhstan | ☒ SK Slovakia |
| ☒ CA Canada | ☒ LC Saint Lucia | ☒ SL Sierra Leone |
| ☒ CH & LI Switzerland and Liechtenstein | ☒ LK Sri Lanka | ☒ TJ Tajikistan |
| ☒ CN China | ☒ LR Liberia | ☒ TM Turkmenistan |
| ☒ CO Colombia | ☒ LS Lesotho | ☒ TN Tunisia |
| ☒ CR Costa Rica | ☒ LT Lithuania | ☒ TR Turkey |
| ☒ CU Cuba | ☒ LU Luxembourg | ☒ TT Trinidad and Tobago |
| ☒ CZ Czech Republic | ☒ LV Latvia | |
| ☒ DE Germany | ☒ MA Morocco | ☒ TZ United Republic of Tanzania |
| ☒ DK Denmark | ☒ MD Republic of Moldova | ☒ UA Ukraine |
| ☒ DM Dominica | ☒ MG Madagascar | ☒ UG Uganda |
| ☒ DZ Algeria | ☒ MK The former Yugoslav Republic of Macedonia | ☒ US United States of America |
| ☒ EC Ecuador | ☒ MN Mongolia | ☒ UZ Uzbekistan |
| ☒ EE Estonia | ☒ MW Malawi | ☒ VC Saint Vincent and the Grenadines |
| ☒ ES Spain | ☒ MX Mexico | ☒ VN Viet Nam |
| ☒ FI Finland | ☒ MZ Mozambique | ☒ YU Yugoslavia |
| ☒ GB United Kingdom | ☒ NO Norway | ☒ ZA South Africa |
| ☒ GD Grenada | | ☒ ZM Zambia |
| ☒ GE Georgia | | ☒ ZW Zimbabwe |
| ☒ GH Ghana | | |

Check-boxes below reserved for designating States which have become party to the PCT after issuance of this sheet:

- | | | |
|--------------------------|--------------------------|--------------------------|
| ☐ | ☐ | ☐ |
| ☐ | ☐ | ☐ |

Precautionary Designation Statement: In addition to the designations made above, the applicant also makes under Rule 4.9(b) all other designations which would be permitted under the PCT except any designation(s) indicated in the Supplemental Box as being excluded from the scope of this statement. The applicant declares that these additional designations are subject to confirmation and that any designation which is not confirmed before the expiration of 15 months from the priority date is to be regarded as withdrawn by the applicant at the expiration of that time limit. (Confirmation (including fees) must reach the receiving Office within the 15-month time limit.)

Box No. VI PRIORITY CLAIM				
The priority of the following earlier application(s) is hereby claimed:				
Filing date of earlier application (day/month/year)	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) 10 April 2002 (10/04/02)	60/371,461	US		
item (2)				
item (3)				
item (4)				
item (5)				

☐ Further priority claims are indicated in the Supplemental Box.

The receiving Office is requested to prepare and transmit to the International Bureau a certified copy of the earlier application(s) (only if the earlier application was filed with the Office which for the purposes of this international application is the receiving Office) identified above as:

☐ all items ☒ item (1) ☐ item (2) ☐ item (3) ☐ item (4) ☐ item (5) ☐ other, see Supplemental Box

* Where the earlier application is an ARIPO application, indicate at least one country party to the Paris Convention for the Protection of Industrial Property or one Member of the World Trade Organization for which that earlier application was filed (Rule 4.10(b)(ii)):

Box No. VII INTERNATIONAL SEARCHING AUTHORITY		
Choice of International Searching Authority (ISA) (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):		
ISA/ .EP.		
Request to use results of earlier search; reference to that search (if an earlier search has been carried out by or requested from the International Searching Authority):		
Date (day/month/year)	Number	Country (or regional Office)

Box No. VIII DECLARATIONS		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:		This international application is accompanied by the following items: Mark the appropriate check-boxes below and indicate in right column the number of each item:	Number of parts
(a) in paper form, the following number of sheets:		1. ☒ fee calculation sheet	
request (including declaration sheets)	5	2. ☐ original separate power of attorney	
description (excluding sequence listings and/or tables related thereto)	10	3. ☐ original general power of attorney	
claims	3	4. ☐ copy of general power of attorney, reference number, if any:	
abstract	1	5. ☐ statement explaining lack of signature	
drawings		6. ☐ priority documents identified in Box No. VI as item(s):	
Sub-total number of sheets	19	7. ☐ translation of international application into (language):	
sequence listings		8. ☐ separate indications concerning deposited microorganism or other biological material	
tables related thereto		9. ☐ sequence listings in computer readable form (indicate type and number of carriers)	
(for both, actual number of sheets if filed in paper form, whether or not also filed in computer readable form: see (c) below)		(i) ☐ copy submitted for the purposes of international search under Rule 13ter only (and not as part of the international application)	
Total number of sheets	19	(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	
(b) ☐ only in computer readable form (Section 801(a)(i))		(iii) ☐ together with relevant statement as to the identity of the copy or copies with the sequence listings mentioned in left	
(i) ☐ sequence listings		10. ☐ tables in computer readable form related to sequence listings (indicate type and number of carriers)	
(ii) ☐ tables related thereto		(i) ☐ copy submitted for the purposes of international search under Section 802(b-quater) only (and not as part of the international application)	
(c) ☐ also in computer readable form (Section 801(a)(i))		(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 Section 802(b-quater)	
(i) ☐ sequence listings		(iii) ☐ together with relevant statement as to the identity of the copy or copies with the tables mentioned in left column	
(ii) ☐ tables related thereto		11. ☒ other (specify: acknowledgement card)	
Type and number of carriers (diskette, CD ROM, CD R or other) on which are contained the			
☐ sequence listings:			
☐ tables related thereto:			
(additional copies to be indicated under items 9(ii) and/or 10(ii), in right column)			

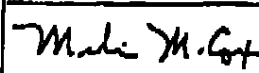
Figure of the drawings which should accompany the abstract:

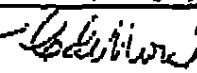
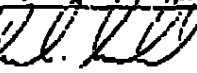
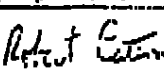
Language of filing of the international application:

English

Box No. X SIGNATURE OF APPLICANT, AGENT OR COMMON REPRESENTATIVE

Name of each signatory, indicating the name of the person signing and the capacity in which the person signs (if each capacity is not obvious from preceding line request).



Melvin M. Cox
 Vice President
 Sun Chemical Corporation

Ryszard Brycha
 Mora Lada
 Robert Auerbach
 Roderic Catena

For receiving Office use only		2. Drawings
1. Date of actual receipt of the purported international application:		
3. Corrected date of actual receipt due to later but timely received papers or drawings completing the purported international application:		☐ not received:
4. Date of timely receipt of the required corrections under PCT Article 11(2):		
5. International Searching Authority	ISA/	5. ☐ 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:

PCT

FEE CALCULATION SHEET

Annex to the Request

For receiving Office use only

International Application No.

Applicant's or agent's
file reference

C-536

Date stamp of the receiving Office

Applicant:
Sun Chemical Corporation

CALCULATION OF PRESCRIBED FEES

1. TRANSMITTAL FEE 240.00 T

2. SEARCH FEE 700.00 S

International search to be carried out by EP

(If two or more International Searching Authorities are competent to carry out the international search, indicate the name of the Authority which is chosen to carry out the international search.)

3. INTERNATIONAL FEE

Basic Fee

Where item (b) and/or (c) of Box No. IX apply, enter Sub-total number of sheets } 19
Where item (b) and (c) of Box No. IX do not apply, enter Total number of sheets }

b1 first 30 sheets 407.00 b1

b2 0 x fee per sheet = 0.00 b2
number of sheets in excess of 30

b3 additional component (only if sequence listings and/or tables related thereto are filed in computer readable form under Section 801(a)(i), or both in that form and on paper, under Section 801(a)(ii):

400 x fee per sheet = b3

Add amounts entered at b1, b2 and b3 and enter total at B 407.00 B

Designation Fees

The international application contains 5 designations.

5 x 88.00 = 440.00 D
number of designation fees amount of designation fee payable (maximum 5)

Add amounts entered at B and D and enter total at I 847.00 I

(Applicants from certain States are entitled to a reduction of 75% of the international fee. Where the applicant is (or all applicants are) so entitled, the

4. FEE FOR PRIORITY DOCUMENT (if applicable) 15.00 P

5. TOTAL FEES PAYABLE 1,802.00

Add amounts entered at T, S, I and P, and enter total in the TOTAL box

TOTAL

☐ The designation fees are not paid at this time.

MODE OF PAYMENT

- ☒ authorization to charge deposit account (see below) ☐ postal money order ☐ cash ☐ coupons
☐ cheque ☐ bank draft ☐ revenue stamps ☐ other (specify):

AUTHORIZATION TO CHARGE (OR CREDIT) DEPOSIT ACCOUNT

(This mode of payment may not be available at all receiving Offices)

☒ Authorization to charge the total fees indicated above.

☒ (This check-box may be marked only if the conditions for deposit accounts of the receiving Office so permit) Authorization to charge any deficiency or credit any overpayment in the total fees indicated above.

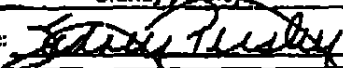
☒ Authorization to charge the fee for priority document.

Receiving Office: RO/ US

Deposit Account No.: 18-4868

Date: April 10, 2003

Name: Sidney Bersley

Signature: 

PCT COOPERATION TREATY

From the INTERNATIONAL SEARCHING AUTHORITY

PCT

NOTIFICATION OF TRANSMITTAL OF
THE INTERNATIONAL SEARCH REPORT
OR THE DECLARATION

(PCT Rule 44.1)

To:
PERSLEY, Sidney
222 Bridge Plaza South
Fort Lee, New Jersey 07024
UNITED STATES OF AMERICA

RECEIVED
OCT 14 2003
SIDNEY PERSLEY

Date of mailing
(day/month/year)

10/10/2003

Applicant's or agent's file reference

C-536

FOR FURTHER ACTION

See paragraphs 1 and 2 below

International Application No.

PCT/HIS 03/11233

International filing date

(day/month/year)

10/04/2003

Applicant

SUN CHEMICAL CORPORATION

1. ☒ The applicant is hereby notified that the International Search Report has been established and is transmitted herewith.

Filing of amendments and statement under Article 18:

The applicant is entitled, if he so wishes, to amend the claims of the International Application (see Rule 48):

When? The time limit for filing such amendments is normally 2 months from the date of transmittal of the International Search Report; however, for more details, see the notes on the accompanying sheet.

Where? Directly to the International Bureau of WIPO
34, chemin des Colombettes
1211 Geneva 20, Switzerland
Facsimile No.: (41-22) 740.14.56

For more detailed instructions, see the notes on the accompanying sheet.

2. ☐ The applicant is hereby notified that no International Search Report will be established and that the declaration under Article 17(2)(a) to that effect is transmitted herewith.

3. ☐ With regard to the protest against payment of (an) additional fee(s) under Rule 40.2, the applicant is notified that:

☐ the protest together with the decision thereon has been transmitted to the International Bureau together with the applicant's request to forward the texts of both the protest and the decision thereon to the designated Offices.

☐ no decision has been made yet on the protest; the applicant will be notified as soon as a decision is made.

4. Further action(s): The applicant is reminded of the following:

Shortly after 18 months from the priority date, the international application will be published by the International Bureau. If the applicant wishes to avoid or postpone publication, a notice of withdrawal of the international application, or of the priority claim, must reach the International Bureau as provided in Rules 90bis.1 and 90bis.5, respectively, before the completion of the technical preparations for international publication.

Within 19 months from the priority date, a demand for international preliminary examination must be filed if the applicant wishes to postpone the entry into the national phase until 30 months from the priority date (in Annex C/MINER A/AN. I/AN. I).

Within 30 months from the priority date, the applicant must perform the prescribed acts for entry into the national phase before all designated Offices which have not been elected in the demand or in a later election within 19 months from the priority date or could not be elected because they are not bound by Chapter II.

Name and mailing address of the International Searching Authority



European Patent Office, P.O. Box 5018, D-69110 Heidelberg
NL-2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3018

Authorized officer

Panayota Georgakopoulou

P. INT COOPERATION TREATY

From the INTERNATIONAL SEARCHING AUTHORITY

PCT

NOTIFICATION OF TRANSMITTAL OF
THE INTERNATIONAL SEARCH REPORT
OF THE DECLARATION

(PCT Rule 44.1)

To:
PERSLEY, Sidney
222 Bridge Plaza South
Fort Lee, New Jersey 07024
UNITED STATES OF AMERICA

RECEIVED
OCT 14 2003
SIDNEY PERSLEY

Date of mailing
(day/month/year) 10/10/2003

Applicant's or agent's file reference

C-536

FOR FURTHER ACTION See paragraphs 1 and 4 below

International application No.

PCT/US 03/11233

International filing date
(day/month/year)

10/04/2003

Applicant

SUN CHEMICAL CORPORATION

1. ☒ The applicant is hereby notified that the International Search Report has been established and is transmitted herewith.

Filing of amendments and statement under Article 18:

The applicant is entitled, if he so wishes, to amend the claims of the International Application (see Rule 48):

When? The time limit for filing such amendments is normally 2 months from the date of transmittal of the International Search Report; however, for more details, see the notes on the accompanying sheet.

Where? Directly to the International Bureau of WIPO
34, chemin des Colombettes
1211 Geneva 20, Switzerland
Facsimile No.: (41-22) 740.14.36

For more detailed instructions, see the notes on the accompanying sheet.

2. ☐ The applicant is hereby notified that no International Search Report will be established and that the declaration under Article 17(2)(a) to that effect is transmitted herewith.

3. ☐ With regard to the protest against payment of (an) additional fee(s) under Rule 40.2, the applicant is notified that:

☐ the protest together with the decision thereon has been transmitted to the International Bureau together with the applicant's request to forward the texts of both the protest and the decision thereon to the designated Offices.

☐ no decision has been made yet on the protest; the applicant will be notified as soon as a decision is made.

4. Further action(s): The applicant is reminded of the following:

Shortly after 18 months from the priority date, the International application will be published by the International Bureau. If the applicant wishes to avoid or postpone publication, a notice of withdrawal of the International application, or of the priority claim, must reach the International Bureau as provided in Rules 90bis.1 and 90bis.3, respectively, before the completion of the technical preparations for International publication.

Within 18 months from the priority date, a demand for International preliminary examination must be filed if the applicant wishes to postpone the entry into the national phase until 30 months from the priority date (in some Offices even later).

Within 20 months from the priority date, the applicant must perform the prescribed acts for entry into the national phase before all designated Offices which have not been elected in the demand or in a later election within 10 months from the priority date or could not be elected because they are not bound by Chapter II.

Name and mailing address of the International Searching Authority

European Patent Office, P.B. 5515 Patentkanal 2
NL-2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

Panayota Georgakopoulou

NOTES TO FORM PCT/ISA/220

These Notes are intended to give the basic instructions concerning the filing of amendments under Article 19. The Notes are based on the requirements of the Patent Cooperation Treaty, the Regulations and the Administrative Instructions under that Treaty. In case of discrepancy between these Notes and these requirements, the latter are applicable. For more detailed information, see also the PCT Applicant's Guide, a publication of WIPO.

In these Notes, "Article", "Rule", and "Section" refer to the provisions of the PCT, the PCT Regulations and the PCT Administrative Instructions respectively.

INSTRUCTIONS CONCERNING AMENDMENTS UNDER ARTICLE 19

The applicant has, after having received the international search report, one opportunity to amend the claims of the international application. It should however be emphasized that, since all parts of the international application (claims, description and drawings) may be amended during the international preliminary examination procedure, there is usually no need to file amendments of the claims under Article 19 except where, e.g. the applicant wants the latter to be published for the purposes of provisional protection or has another reason for amending the claims before international publication. Furthermore, it should be emphasized that provisional protection is available in some States only.

What parts of the international application may be amended?

Under Article 19, only the claims may be amended.

During the international phase, the claims may also be amended (or further amended) under Article 34 before the International Preliminary Examining Authority. The description and drawings may only be amended under Article 34 before the International Examining Authority.

Upon entry into the national phase, all parts of the international application may be amended under Article 28 or, where applicable, Article 41.

When?

Within 2 months from the date of transmittal of the international search report or 16 months from the priority date, whichever time limit expires later. It should be noted, however, that the amendments will be considered as having been received on time if they are received by the International Bureau after the expiration of the applicable time limit but before the completion of the technical preparations for international publication (Rule 48.1).

Where not to file the amendments?

The amendments may only be filed with the International Bureau and not with the receiving Office or the International Searching Authority (Rule 48.2).

Where a demand for international preliminary examination has been filed, see below.

How?

Either by cancelling one or more entire claims, by adding one or more new claims or by amending the text of one or more of the claims as filed.

A replacement sheet must be submitted for each sheet of the claims which, on account of an amendment or amendments, differs from the sheet originally filed.

All the claims appearing on a replacement sheet must be numbered in Arabic numerals. Where a claim is cancelled, no renumbering of the other claims is required. In all cases where claims are renumbered, they must be renumbered consecutively (Administrative Instructions, Section 205(b)).

The amendments must be made in the language in which the international application is to be published.

What documents must/may accompany the amendments?

Letter (Section 205(b)):

The amendments must be submitted with a letter.

The letter will not be published with the international application and the amended claims. It should not be confused with the "Statement under Article 18(1)" (see below, under "Statement under Article 19(1)").

The letter must be in English or French, at the choice of the applicant. However, if the language of the international application is English, the letter must be in English; if the language of the international application is French, the letter must be in French.

NOTES TO FORM PCT/ISA/220 (continued)

The letter must indicate the differences between the claims as filed and the claims as amended. It must, in particular, indicate, in connection with each claim appearing in the international application (it being understood that identical indications concerning several claims may be grouped), whether

- (i) the claim is unchanged;
- (ii) the claim is cancelled;
- (iii) the claim is new;
- (iv) the claim replaces one or more claims as filed;
- (v) the claim is the result of the division of a claim as filed.

The following examples illustrate the manner in which amendments must be explained in the accompanying letter:

1. [Where originally there were 48 claims and after amendment of some claims there are 51]:
"Claims 1 to 29, 31, 32, 34, 35, 37 to 48 replaced by amended claims bearing the same numbers; claims 30, 33 and 36 unchanged; new claims 49 to 51 added."
2. [Where originally there were 16 claims and after amendment of all claims there are 11]:
"Claims 1 to 16 replaced by amended claims 1 to 11."
3. [Where originally there were 14 claims and the amendments consist in cancelling some claims and in adding new claims]:
"Claims 1 to 6 and 14 unchanged; claims 7 to 13 cancelled; new claims 15, 16 and 17 added," or
"Claims 7 to 13 cancelled; new claims 15, 16 and 17 added; all other claims unchanged."
4. [Where various kinds of amendments are made]:
"Claims 1-10 unchanged; claims 11 to 13, 18 and 19 cancelled; claims 14, 15 and 16 replaced by amended claim 14; claim 17 subdivided into amended claims 15, 16 and 17; new claims 20 and 21 added."

"Statement Under article 19(1)" (Rule 82.4)

The amendments may be accompanied by a statement explaining the amendments and indicating any impact that such amendments might have on the description and the drawings (which cannot be amended under Article 19(1)).

The statement will be published with the international application and the amended claims.

It must be in the language in which the international application is to be published.

It must be brief, not exceeding 600 words if in English or if translated into English.

It should not be confused with and does not replace the letter indicating the differences between the claims as filed and as amended. It must be filed on a separate sheet and must be identified as such by a heading, preferably by using the words "Statement Under Article 19(1)."

It may not contain any disparaging comments on the international search report or the relevance of citations contained in that report. Reference to citations, relevant to a given claim, contained in the international search report may be made only in connection with an amendment of that claim.

Consequence if a demand for international preliminary examination has already been filed

If, at the time of filing any amendments under Article 19, a demand for international preliminary examination has already been submitted, the applicant must, preferably, at the same time as filing the amendments with the International Bureau, also file a copy of such amendments with the International Preliminary Examining Authority (see Rule 82.1(a), first sentence).

Consequences with regard to translation of the international application for entry into the national phase

The applicant's attention is drawn to the fact that, where upon entry into the national phase, a translation of the claims as amended under Article 19 may have to be furnished to the designated/elected Offices, instead of, or in addition to, the translation of the claims as filed.

For further details on the requirements of each designated/elected Office, see Volume II of the PCT Applicant's Guide.

NOTES TO FORM PCT/ISA/220 (continued)

The letter must indicate the differences between the claims as filed and the claims as amended. It must, in particular, indicate, in connection with each claim appearing in the international application (it being understood that identical indications concerning several claims may be grouped), whether

- (i) the claim is unchanged;
- (ii) the claim is cancelled;
- (iii) the claim is new;
- (iv) the claim replaces one or more claims as filed;
- (v) the claim is the result of the division of a claim as filed.

The following examples illustrate the manner in which amendments must be explained in the accompanying letter:

1. [Where originally there were 48 claims and after amendment of some claims there are 51]:
"Claims 1 to 29, 31, 32, 34, 35, 37 to 48 replaced by amended claims bearing the same numbers; claims 30, 33 and 36 unchanged; new claims 49 to 51 added."
2. [Where originally there were 15 claims and after amendment of all claims there are 11]:
"Claims 1 to 15 replaced by amended claims 1 to 11."
3. [Where originally there were 14 claims and the amendments consist in cancelling some claims and in adding new claims]:
"Claims 1 to 6 and 14 unchanged; claims 7 to 13 cancelled; new claims 15, 16 and 17 added" or
"Claims 7 to 13 cancelled; new claims 15, 16 and 17 added; all other claims unchanged."
4. [Where various kinds of amendments are made]:
"Claims 1-10 unchanged; claims 11 to 13, 16 and 19 cancelled; claims 14, 15 and 18 replaced by amended claim 14; claim 17 subdivided into amended claims 15, 16 and 17; new claims 20 and 21 added."

"Statement under Article 19(1)" (Rule 46.4)

The amendments may be accompanied by a statement explaining the amendments and indicating any impact that such amendments might have on the description and the drawings (which cannot be amended under Article 19(1)).

The statement will be published with the international application and the amended claims.

It must be in the language in which the international application is to be published.

It must be brief, not exceeding 500 words if in English or if translated into English.

It should not be confused with and does not replace the letter indicating the differences between the claims as filed and as amended. It must be filed on a separate sheet and must be identified as such by a heading, preferably by using the words "Statement under Article 19(1)."

It may not contain any disparaging comments on the international search report or the relevance of citations contained in that report. Reference to citations, relevant to a given claim, contained in the international search report may be made only in connection with an amendment of that claim.

Consequence if a demand for international preliminary examination has already been filed

If, at the time of filing any amendments under Article 19, a demand for international preliminary examination has already been submitted, the applicant must preferably, at the same time of filing the amendments with the International Bureau, also file a copy of such amendments with the International Preliminary Examining Authority (see Rule 62.2(a), first sentence).

Consequences with regard to translation of the international application for entry into the national phase

The applicant's attention is drawn to the fact that, where upon entry into the national phase, a translation of the claims as amended under Article 19 may have to be furnished to the designated/elected Offices, instead of, or in addition to, the translation of the claims as filed.

For further details on the requirements of each designated/elected Office, see Volume II of the PCT Applicant's Guide.

(F) C.534

67

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

C# 7

(19) World Intellectual Property
Organization
International Bureau



1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

(43) International Publication Date
23 October 2003 (23.10.2003)

PCT

(10) International Publication Number
WO 2003/087239 A3

- (51) International Patent Classification: C09D 11/10 (74) Agent: PERSLEY, Sidney; 222 Bridge Plaza South, Fort Lee, NJ 07024 (US).
- (21) International Application Number: PCT/US2003/011233 (81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NG, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.
- (22) International Filing Date: 10 April 2003 (10.04.2003)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data: 60/371,461 10 April 2002 (10.04.2002) US
- (84) Designated States (regional): ARIPO patent (GI) GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW; Eurasian patent (AM): AZ, BY, KG, KZ, MD, RU, TJ, TM; European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, UK); OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).
- (71) Applicant (for all designated States except US): SUN CHEMICAL CORPORATION (US/US); 222 Bridge Plaza South, Fort Lee, NJ 07024 (US).
- (72) Inventors; and
- (73) Inventors/Applicants (for US only): SPYCHA, Ryszard (US/US); 2 Hillside Terrace, Wallington, NJ 07097 (US); LEWA, Miron (US/US); 116 Mennot Road, Little Ferry, NJ 07643 (US); AUERBACH, Robert (US/US); 35 Hawthorne Drive, Princeton Junction, NJ 08550 (US); CATENA, Robert (US/US); 78 Plenge Drive, Belleville, NJ 07109 (US).
- Published:
— with international search report
- (86) Date of publication of the international search report: 3 February 2004
- For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

WO 2003/087239 A3

(54) Title: VISCOSITY STABILIZING BLEND VEHICLES FOR PREPARING WATER BASED FLEXOGRAPHIC PRINTING INKS

(57) Abstract: A long term storage viscosity stabilizing blend vehicle for water based flexographic printing inks having a styrenated acrylic polymer, an acetylene diol surfactant, and a silicone based de-foaming agent. The blend vehicle further containing at least one rheology modifying urea and/or sorbitol which further improve viscosity stability.

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference C-536	FOR FURTHER ACTION see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.	
International application No. PCT/US 03/11233	International filing date (day/month/year) 10/04/2003	(Earliest) Priority Date (day/month/year) 10/04/2002
Applicant SUN CHEMICAL CORPORATION		

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 03 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, unless otherwise indicated under this item.

☐ the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

b. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international search was carried out on the basis of the sequence listing:

☐ contained in the international application in written form.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form.

☐ the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☐ the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

2. ☐ Certain claims were found unsearchable (See Box I).

3. ☐ Unity of invention is lacking (see Box II).

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 36.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the drawings to be published with the abstract is Figure No.

☐ as suggested by the applicant.

☐ because the applicant failed to suggest a figure.

☐ because this figure better characterizes the invention.

☒ None of the figures.

INTERNATIONAL SEARCH REPORT

Intern: 1 Application No
PCT/US 03/11233A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 C09D11/10

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 7 C09D

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 practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim 1 to
X	US 5 344 872 A (DEBORD THEO J ET AL) 6 September 1994 (1994-09-06) examples 2,3; tables 1,5	1-25
A	US 5 972 088 A (KRISHNAM RAMASAMY ET AL) 26 October 1999 (1999-10-26) claims; examples	7
A	EP 0 666 281 A (SUN CHEMICAL CORP) 9 August 1995 (1995-08-09) examples	1-26

☐ Further documents are listed in the continuation of box C.☒ Patent family members are listed in Annex.

* Special categories of cited documents:

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier document but published on or after the international filing date
- "L" document which may throw doubt on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

- "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
- "X" document of particular relevance: the claimed invention cannot be considered novel or obvious in view of the document
- "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
- "Z" document member of the same patent family

Date of the actual completion of the international search

1 October 2003

Date of mailing of the international search report

10/10/2003

Name and mailing address of the ISA

European Patent Office, P.B. 6516 Patentkan 2
NL - 2280 HV Rijswijk
Tel (+31-70) 340-2040, Tx 31 551 epo nl,
Fax (+31-70) 340-3016

Authorized officer

Ellrich, K

INTERNATIONAL SEARCH REPORT

Informa n patent family members

Intern I Application No
PCT/US 03/11233

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5344872	A	06-09-1994	NONE
US 5972088	A	26-10-1999	US 5725646 A 10-03-1998 EP 0988349 A1 29-03-2000 WO 9927023 A1 03-06-1999 AU 710477 B2 23-09-1999 AU 2322997 A 01-10-1997 CA 2242558 A1 18-09-1997 DE 69707430 D1 22-11-2001 DE 69707430 T2 20-06-2002 DK 886670 T3 21-01-2002 EP 0886670 A1 30-12-1998 US 2002083865 A1 04-07-2002 WO 9733944 A1 19-09-1997 US 6200372 B1 13-03-2001 ZA 9702145 A 17-09-1997
EP 0666281	A	09-08-1995	CA 2141466 A1 03-08-1995 EP 0666281 A2 09-08-1995 US 5965647 A 12-10-1999 US 6303676 B1 16-10-2001 US 5814701 A 29-09-1998

REQUISITOS NECESARIOS PARA PRESENTACION Y AGILIZACION DEL TRAMITE

	USUARIO	RADICADOR
PATENTE DE INVENCION	()	()
- Indicación de que se solicita la concesión de una patente.	()	()
- Datos de identificación del solicitante o de la persona que se presenta la solicitud.	()	()
- Descripción de la invención.	()	()
- Dibujos de ser estos pertinentes.	()	()
- Comprobante de pago de las tasas establecidas.	()	()
COMPLETA ()	INCOMPLETA ()	()
 DISEÑO INDUSTRIAL ()		
- Indicación de que se solicita el registro de Diseño Industrial	()	()
- Datos de identificación del solicitante o de la persona que presenta la solicitud.	()	()
- Representación gráfica o fotográfica del Diseño Industrial o muestra del Material que incorpora el diseño.	()	()
- Comprobante de pago de las tasas establecidas	()	()
COMPLETA ()	INCOMPLETA ()	()
 ESQUEMA DE TRAZADO ()		
- Indicación de que solicita el registro de un Esquema de trazado.	()	()
- Datos de identificación del solicitante o de la persona que presenta la solicitud.	()	()
- Representación gráfica del esquema de trazado	()	()
- Comprobante de pago de las tasas establecidas.	()	()
COMPLETA ()	INCOMPLETA ()	()

Firma Responsable:

Fecha:

Folios 70

Radicación : 04101453 00000000
 Fecha (UMB) : 2004-10-11 16:54:02
 Trámite : 011 PCI-PATENT 379 FASE INCI 411 PRESENTAR
 Dependencia : 2020 DIVISION DE NUEVAS CREACIONES

2020
Bogotá, D.C.,

Doctora:
DILIA MARIA RODRIGUEZ D'ALEMAN
Apoderada
SUN CHEMICAL CORPORATION

Oficio N° 16205

ASUNTO:	Radicación N°	04-101453
	Solicitud Internacional	PCT/US03/011233
	Fecha inicio fase nacional	10/11/2004
	Trámite	011
	Evento	379
	Actuación	418
	Folios	001

Como resultado del examen de forma, realizado con fundamento en el artículo 38 de la Decisión 486 de la Comisión de la Comunidad Andina, artículo 27 del Tratado de Cooperación en Materia de Patentes (PCT), regla 51 bis del Reglamento y Circular Única de la Superintendencia de Industria y Comercio, se le comunica que:

- La solicitud no contiene la copia del documento en que consta la cesión del derecho a la patente del inventor al solicitante o a su causante. (Art. 26-k) Decisión 486).

En cumplimiento de lo dispuesto por el artículo 39 de la Decisión 486, se le requiere para que dentro del término de dos meses siguientes a la fecha de notificación del presente oficio, complete los requisitos anteriormente enunciados. En caso de no dar cumplimiento al presente requerimiento, la solicitud se considerará abandonada y perderá su prelación.

Notifíquese el presente oficio conforme a lo dispuesto en el numeral 5.2, literal e), del capítulo quinto del título primero de la Circular Única N° 10 de 2001.



ALIX CARMENZA CESPEDES DE VERGEL
Jefe de la División de Nuevas Creaciones.

El anterior requerimiento fue notificado por fijación en lista de fecha, 05.12.2004