

DELEGATURA DE PROPIEDAD INDUSTRIAL
División de Nuevas Creaciones

SOLICITUD
PATENTE DE INVENCION

21. EXPEDIENTE No. _____

54. TÍTULO _____
COLORANTES AZOICOS DISPERSOS

51. CLASIFICACIÓN INTERNACIONAL _____

71. SOLICITANTE _____
COLOURTEX INDUSTRIES LIMITED

DOMICILIO _____
GUARANE, INDIA

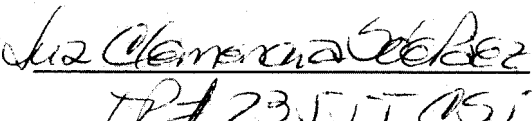
74. APODERADO _____
LUZ CLEMENCIA DE PAEZ
C.C. 35.456.344 de Usaquén

22. BOGOTÁ, D. C., _____

 Industria y Comercio SUPERINTENDENCIA	SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO  No. 12-123158- -00000-0000 Fecha: 2012-07-23 16:41:34 Dep. 2020 DIR.NUEVASCR Tra. 11 PATENTEIYII Eve: 379 FASENACIONALII Act 411 PRESENTACION Folios: 59
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DIRECCIÓN DE NUEVAS CREACIONES
SOLICITUD FASE NACIONAL -PCT

1	TIPO DE SOLICITUD	☒ Patente de invención ☐ Capítulo I	☐ Patente de Modelo de Utilidad ☒ Capítulo II
2	DATOS SOLICITUD INTERNACIONAL PCT (86)		
Solicitud Internacional No.		PCT/IN2010/000850	Fecha 2010/12/23
Publicación Internacional No.		WO 2011/077461	Fecha 2011/06/30
3	TÍTULO DE LA INVENCIÓN		
COLORANTES AZOICOS DISPERSOS			
4	CLASIFICACIÓN INTERNACIONAL (CIP)		
C09B 029/001, C09B 029/008, C09B 029/039, C09B 029/045, D06P 001/016, D06P 003/054			
5	SOLICITANTE (S) ☐ Esta persona también es inventor. Para datos adicionales utilizar hoja de información complementaria		
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COLOURTEX INDUSTRIES LIMITED			
6	DATOS DEL SOLICITANTE		
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DEPARTAMENTO/ESTADO		Gujarat 395-023	NACIONALIDAD O LUGAR DE CONSTITUCIÓN
PAÍS DE RESIDENCIA		India	
7	INVENTOR (ES) Para datos adicionales utilizar hoja de información complementaria		
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2. HIMENO		Kiyoshi	Japonés
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OTRO(S) SOLICITANTE(S) Y/O (OTRO(S)) INVENTOR(ES)			
☐ Los demás solicitantes y/o (demás) inventores se indican en una hoja a continuación.			
9	☐ REPRESENTANTE LEGAL ☒ APODERADO		
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De Páez		Luz Clemencia	C.C . 35.456.344 T.P . 23.555
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PAÍS	COLOMBIA		No. RADICACIÓN DE PROTOCOLO DE PODER GENERAL

10	DECLARACIONES DE PRIORIDAD ☒ SI ☐ NO			
(33) PAÍS DE ORIGEN		CÓDIGO PAÍS	(31) NÚMERO	(32) FECHA (AAAA/MM/DD)
INDIA		IN	2979/MUM/2009	2009/12/23
11	DECLARACIÓN SOBRE USO DE RECURSOS GENÉTICOS O BIOLÓGICOS			
<i>Declaro que el objeto de la presente solicitud de patente fue obtenido a partir de recursos genéticos o biológicos de los que cualquiera de los países miembros de la Comunidad Andina es país de origen.</i>				
☐ SI ☐ NO				
Nota: En caso afirmativo deberá anexar copia del contrato de acceso de recursos genéticos o productos derivados, o certificado o número de registro, expedido por la Autoridad competente.				
12	DECLARACIÓN SOBRE USO DE CONOCIMIENTOS TRADICIONALES			
<i>Declaro que el objeto de la presente solicitud de patente fue obtenido a partir de conocimientos tradicionales de comunidades indígenas, afroamericanas o locales de países miembros de la Comunidad Andina.</i>				
☐ SI ☐ NO				
Nota: En caso afirmativo deberá anexar la licencia o autorización de uso de conocimiento tradicional, o certificado, o número de registro expedido por la Autoridad competente.				
13	REDUCCIÓN DE TASAS			
<i>Declaro que carezco de medios económicos para presentar la solicitud de patente.</i>				
☐ SI ☐ NO				
Nota: En caso de ser persona natural y carecer de medios económicos, y por lo tanto, aplique la reducción de tasas a que se refiere la resolución vigente en tarifas, debe firmar la presente solicitud bajo la gravedad de juramento.				
Micro, pequeñas y medianas empresas ☐				
Universidades públicas o privadas ☐				
Entidades sin ánimo de lucro ☐				
Debe aportar los documentos que se indican en el numeral 17 de anexos				
14	AUTORIZACIÓN DE NOTIFICACIÓN EN LÍNEA ☐ SI ☐ NO			
Manifiesto que he leído y entendido perfectamente los términos y condiciones de uso de medios electrónicos para las notificaciones en línea a través de Internet de los actos administrativos proferidos por la Superintendencia de Industria y Comercio que deben ser notificados personalmente y, en consecuencia, autorizo el servicio de notificación a través de internet.				
15	COMPROBANTE DE PAGO O PAGO ELECTRÓNICO	No. 12-0071484	Fecha: 2012/07/13	
16	FIRMA DEL SOLICITANTE, DEL APODERADO O DEL REPRESENTANTE LEGAL			
<i>Junto a cada firma, indicar el nombre del firmante y su calidad (si tal calidad no es obvia al leer el petitorio)</i>				
Nombre del Firmante LUZ CLEMENCIA DE PAEZ		Firma 		
C.C 35.456.344 de Usaquen		Tarjeta Profesional 23.555		

17	ANEXOS
Documentación Técnica Solicitud Internacional en castellano 1. ☒ Descripción N° de folios: 14 2. ☒ Reivindicaciones N° Reivindicaciones: 8 3. ☐ Dibujos y/o figuras N° folios: 4. ☒ Resumen. 5. ☐ Certificado de depósito de material biológico si fuera el caso. 6. ☐ Listado de secuencias de nucleótidos y/o aminoácidos en forma digital si fuera el caso. 7. ☒ Arte final 12 x 12. 8. ☐ Anexo formato digital. ☒ Traducción Al Español De Los Anexos Presentados Junto Con El Informe Del Examen Preliminar Internacional..	

Documentación Jurídica

9. ☒ Poder de COLOURTEX INDUSTRIES LIMITED

10. ☐ Documento que legalmente pruebe la cesión del inventor al solicitante o a su causante.

11. ☐ Copia del contrato de acceso de recursos genéticos o productos derivados, certificado o número de registro, si fuera el caso.

12. ☐ Copia de la licencia o autorización de Conocimientos Tradicionales, certificado o número de registro, si fuera el caso.

13. Reducción de tasas

Micro, pequeñas o medinas empresas

☐ Copia simple de la declaración de renta del año inmediatamente anterior, o en su defecto prueba documental idónea.

☐ Documento de constancia de cumplimiento con lo establecido en la ley 905 de 2004.

Universidades públicas o privadas

☐ Copia acto de reconocimiento institucional emitido por el Ministerio de Educación

Entidades sin ánimo de lucro

☐ Copia de registro vigente en Cámara de comercio.

☐ Hoja de información complementaria.

☐ Otros, especificar

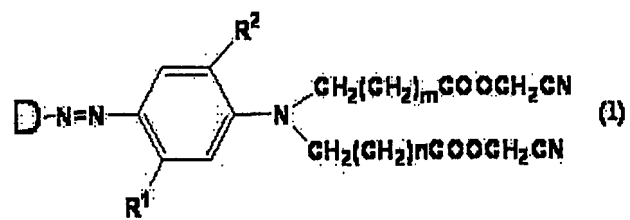
14. ☒ Comprobante de pago de la tasa de presentación de la solicitud.

15. ☐ Comprobante de pago por reivindicación de prioridad.

16. ☐ Comprobante de pago de la tasa por concepto de excedente de palabras en la publicación.

17. ☐ Comprobante de pago por reivindicación adicional a 10.

FIGURA CARACTERISTICA



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(75) Inventors/Applicants (for US only): **DESAL, Pankaj**
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[JP/JP]; 811-3425 23-4 9Tyuome, Hinosato, Munakata,
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(81) Designated States (unless otherwise indicated, for every
kind of national protection available): AE, AG, AL, AM,
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CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO,

DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT,
HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP,
KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD,
ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI,
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Declarations under Rule 4.17:

- as to applicant's entitlement to apply for and be granted
a patent (Rule 4.17(ii))
- as to the applicant's entitlement to claim the priority of
the earlier application (Rule 4.17(iii))
- of inventorship (Rule 4.17(iv))

Published:

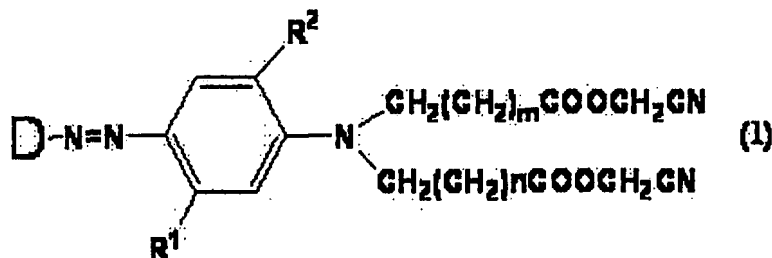
- with international search report (Art. 21(3))
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(88) Date of publication of the international search report:

25 August 2011

Date of publication of the amended claims and statement: 27
October 2011

(54) Title: DISPERSE AZO DYES



(57) Abstract: Novel disperse azo dyes of formula (I), and processes for preparation thereof. These dyes possess superior washing fastness, sublimation fastness and light fastness.

COLORANTES AZOICOS DISPERSOS

CAMPO DE LA INVENCION

La presente invención se refiere a colorantes azoicos dispersos nuevos y uso de los mismos.

ANTECEDENTES DE LA INVENCION

Tradicionalmente, los colorantes dispersos se utilizan para teñir fibras sintéticas y mezclarlas con otras fibras como celulosa, poliuretano, nylon y lana por el método usual de teñido por agotamiento, teñido continuo y técnicas de estampado.

Con las recientes tendencias cambiantes en las exigencias de la moda y del mercado, el consumo de telas mezcladas ha incrementado de manera significativa. Estas nuevas telas están hechas de fibra de tamaño micro, usando fibra de poliéster de denier fino o mezclando fibra con poliuretano, nylon y lana. Las propiedades de solidez de estas nuevas telas de colores empeoran en solidez a la luz y solidez a la sublimación, particularmente en solidez al lavado cuando son teñidas o estampadas con colorantes dispersos convencionales. Las propiedades de solidez empeoran como resultado del aclareo de la fibra teñida al usar fibra de poliéster de denier fino o al mezclar fibra con poliuretano, nylon y lana. En esta campo del teñido y del estampado son deseables los tintes excelentes para soportar este uso.

IN190551 y sus patentes divisionales IN197577 y IN196765 revelan colorantes monoazoicos que contienen un grupo de fluorosulfonilo. Las Patentes Indias mencionadas anteriormente revelan el proceso de coloración de material textil sintético o de mezclas de fibras.

La solicitud de patente 2162/KOLNP/2009, publicada como WO2008/074719, revela una mezcla de tintes dispersos que contiene (a) dos o más tintes dispersos de la fórmula (I).

Así, el estado de la técnica revela compuestos de colorante azoico y el proceso de preparación, pero no imparte propiedades excelentes de solidez, particularmente propiedades de Solidez a la Luz y Solidez al Lavado.

OBJETOS DE LA INVENCION

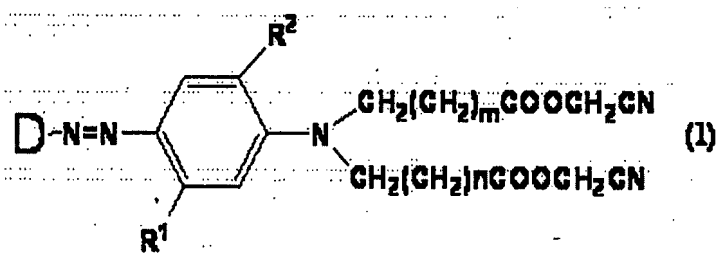
Es objeto de la presente invención suministrar colorantes azoicos dispersos de color amarillo, rojo y azul.

Otro objeto de la presente invención es suministrar un proceso de tintura de materiales textiles sintéticos.

También es objeto de la presente invención suministrar colorantes azoicos dispersos con excelentes propiedades de Solidez a la Luz y Solidez al Lavado en fibra de poliéster.

RESUMEN DE LA INVENCION

De acuerdo a un aspecto de la presente invención, se suministran colorantes dispersos de Fórmula 1.



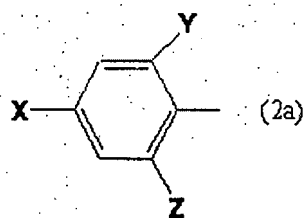
en donde,

R¹ es hidrógeno, metilo, hidroxilo o NHR³

R² es hidrógeno, cloro o metoxi;

en donde,

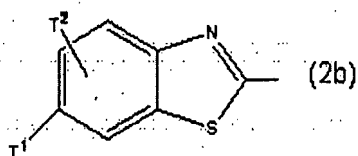
D es un grupo de la fórmula (2a)



en donde,

X, Y y Z son, independiente, hidrógeno, metilo, halógeno, ciano o nitro;

O un grupo de la fórmula (2b)

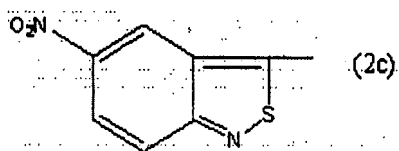


en donde,

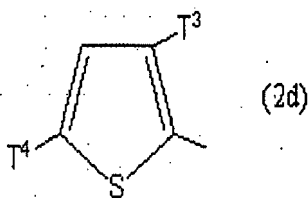
T¹ es, independientemente, hidrógeno, halógeno, nitro, -SO₂CH₃ o -SCN; y

T² es hidrógeno o halógeno;

O un grupo de la fórmula (2c),



O un grupo de la fórmula (2d),



en donde,

T³ y T⁴ son, independientemente, nitro, acetilo, COOR⁴ o ciano;

R³ es -COCH₃, -COC₂H₅, -SO₂CH₃ o SO₂C₂H₅;

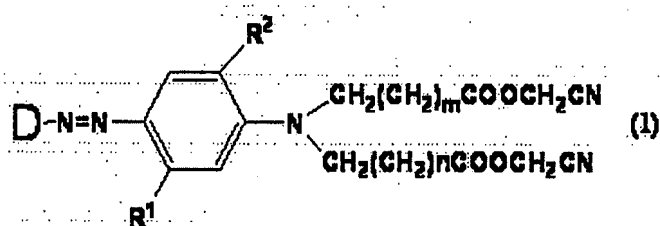
R⁴ es C₁ a C₄ alquilo no sustituido;

n y m son, independientemente, 0.1 o 2.

De acuerdo a otro aspecto de la presente invención, se suministran procesos para la preparación de colorantes azoicos dispersos de Fórmula (1) con una solidez al lavado y solidez a la luz excelentes en la fibra de poliéster.

DESCRIPCIÓN DETALLADA DE LA PRESENTE INVENCION

La presente invención suministra nuevos colorantes dispersos de fórmula (1) con una solidez al lavado y solidez a la luz excelentes.



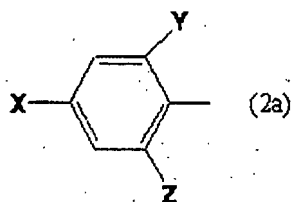
en donde,

R¹ es hidrógeno, metilo, hidroxilo o NHR³;

R² es hidrógeno, cloro o metoxi;

en donde;

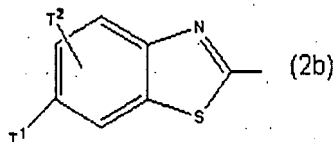
D es un grupo de fórmula (2a)



en donde,

X, Y y Z son, independientemente, hidrógeno, metilo, halógeno, ciano o nitro;

O un grupo de la fórmula (2b),

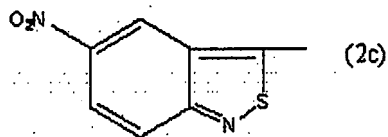


en donde,

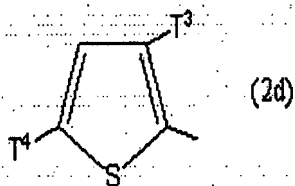
T¹ es, independientemente, hidrógeno, halógeno, nitro, -SO₂CH₃ o -SCN; y

T² es hidrógeno o halógeno;

O un grupo de la fórmula (2c),



O un grupo de la fórmula (2d),



en donde,

T³ y T⁴ son, independientemente, nitro, acetilo, COOR⁴ o ciano;

R³ es -COCH₃, -COC₂H₅, -SO₂CH₃ o SO₂C₂H₅;

R⁴ es C₁a C₄alquilo no sustituido;

n y m son, independientemente, 0.1 o 2.

Adicionalmente, la presente invención describe procesos de síntesis de nuevos colorantes dispersos, la preparación de la composición de colorante y métodos para aplicar estos colorantes a las telas.

Los Colorantes Azoicos se preparan generalmente por medio de diazotización de una amina aromática primaria y que luego se acopla con un componente de acoplamiento adecuado.

En las condiciones adecuadas, es posible diazotizar y acoplar de manera exitosa las aminas aromáticas o heteroaromáticas primarias con componentes de acoplamiento especialmente desarrollados para obtener nuevos colorantes dispersos de fórmula (1) respectivamente. Estos nuevos colorantes dispersos tienen propiedades de solidez al lavado y a la luz excelentes.

La presente invención también suministra una composición que contiene un colorante disperso de la presente invención y, adicionalmente, por lo menos un ingrediente más usado convencionalmente en la aplicación de color, tales como un agente disperso y opcionalmente un surfactante o un agente humectante.

La composición colorante generalmente comprende de 10% a 65%, preferiblemente de 20% a 50% en peso del colorante total como componente único o como mezcla en medio sólido.

Algunos ejemplos típicos de agente dispersante son condensados de lignosulfonatos, el ácido naftalenosulfónico/formaldehído y condensados de ácido fénico/cresílico/sulfanílico/formaldehído. Algunos ejemplos típicos de agentes humectantes son los alquilos, arilos y etoxilatos, que pueden ser sulfonados o fosfato y ejemplos típicos de otros ingredientes que pueden estar presentes son las sales inorgánicas, antiespumantes tales como aceite mineral o nonanol, líquidos orgánicos y neutralizadores. Los agentes dispersantes pueden estar presente en desde 80% a 400% en el peso de las mezclas de colorantes. Los agentes humectantes pueden ser usados de un 0,1% a un 20% sobre el peso de las mezclas de colorantes.

El colorante dispersante o las mezclas de colorantes dispersantes de la presente invención se muelen con el agente dispersante adecuado usando cuentas de cristal o arena en un medio acuoso. Las composiciones pueden tener más adiciones de agentes

dispersantes, rellenos y otros surfactantes, y pueden secarse por medio de una técnica como el secado por pulverización, para dar una composición sólida que comprende de 15% a 65% por peso de colorante.

En caso de teñido con materiales de fibra, los colorantes se muelen en agua con un agente dispersante de la forma usual, y los colorantes terminados se utilizan para teñir o estampar en forma líquida o de polvo luego de secar el líquido por pulverización. Cada colorante terminado se utiliza para teñir y estampar de forma única o en mezclas de dos o más de los colorantes de la presente invención.

En el caso de teñido por agotamiento, la fibra de poliéster, la fibra conjugada y la fibra mezclada se tiñe con una excelente solidez por teñido de alta temperatura, teñido con carrier y teñido continuo. El tinte de fórmula (1) puede ser utilizado individualmente o como una mezcla de los derivados de fórmula (1) para teñido y estampado.

En el caso del estampado, la fibra de poliéster, los materiales de textil se procesan en una solidez excelente por estampado directo o estampado por descarga.

La realización de la presente invención se describe con más detalle con referencia a los siguientes ejemplos, en donde las partes son por peso a menos que se indique lo contrario. La presente invención se explica concretamente a continuación, mas no se limita a estos ejemplos.

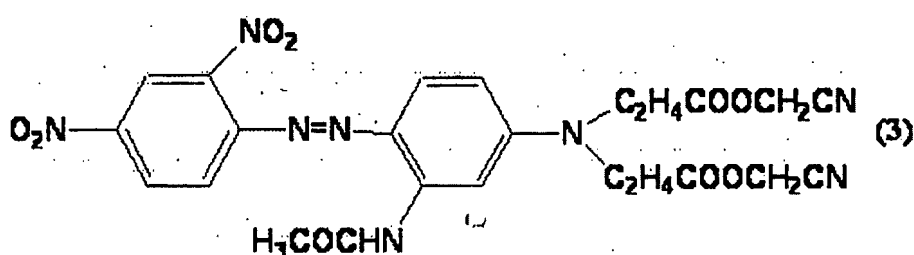
La preparación de los Tintes de la fórmula 1 incluye los siguientes pasos:

- a) Síntesis del componente de acoplamiento;
- b) Diazotización de amina aromática;
- c) Acoplamiento de sal de diazonio con un componente de acoplamiento adecuado;

- d) Fresado con agentes dispersantes adecuados, rellenos y, opcionalmente, agentes humectantes o surfactantes;
- e) Utilizar como líquido o secar por pulverización para obtener la muestra de polvo final.

Ejemplo-1:

Fórmula estructural (3)



El ejemplo 1 de la fórmula estructural se sintetiza de la siguiente manera.

Se añaden 20,0 g de ácido acrílico a la mezcla de 40,0 g de DMF (N,N-dimetilformamida) y 15 g de 3-amino acetanilida, se calienta hasta 80 °C, mezclando constantemente por 2 horas. Una vez completada la reacción, se agregan 19,4 g de cloroacetnitrilo (cloruro de cianometil) a la masa de reacción, que se calienta hasta 80 °C, agitando constantemente por 2 horas. Una vez completada la reacción, esta masa de reacción que contiene 35 g de este acoplador se usa para la siguiente reacción de acoplamiento.

Se agregan 30 ml de ácido nitrosilsulfúrico al 40% se agregan a la mezcla de 19,4 g de 2,4-dinitroanilina y 50 ml de ácido sulfúrico a 0-5% y se mezcla por 2 hr por debajo de 5%. Luego de 2hr se agrega esta solución de sal de diazonio a la mezcla precargada de hielo, agua y 35 g de acoplador, N,N-dicianometoxicarboniletilo-3-acetoamide anilina a 0-5%. La masa de reacción se mezcla por 1 hr por debajo de 5% y luego se filtra. Luego se lava el sólido cristalino con agua fría para obtener el 90% de rendimiento del tinte de fórmula (3). La λ_{max} (en acetona) de los tintes de fórmula (3) es 536 nm.

Se muelen 2,0 g de la torta de prensa húmeda obtenida con 2,0 g de condensado de ácido naftalenosulfónico-formaldehído y 50 g de agua y 500 g de cuentas de vidrio (el lado promedio es de 0,8 mm de diámetro) por 24 hr y, luego del fresado, la masa se filtra para separar las cuentas de vidrio.

Se añaden 20 g del líquido acabado obtenido a 100 ml de agua y pH ajustado a 4 con ácido acético. Se agrega una unidad de poliéster de 10 g al baño de tinte para teñido por agotamiento.

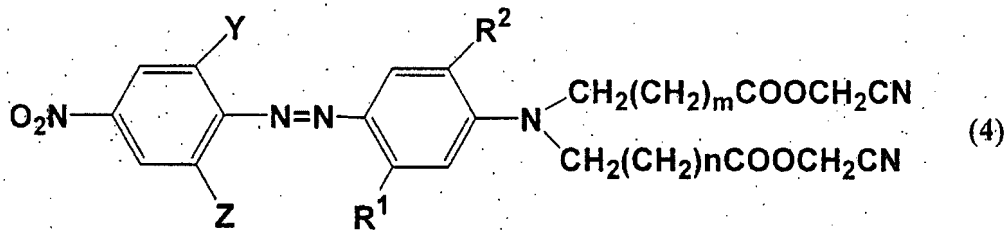
El baño de tinte se calienta hasta 135°C y se mantiene por 40 minutos. Luego de un enjuague, lavado y secado adecuados, el material teñido queda con un matiz Rubí con una excelente solidez al lavado, a la luz y a la sublimación.

Las propiedades de solidez de las telas teñidas se evalúan por medios del siguiente método de prueba.

Solidez al lavado de acuerdo al Método de Prueba AATCC 61 2A, Solidez a la Luz de acuerdo al Método de Prueba ISO 105 B02 y la Prueba de Sublimación a 180 grados por 30 segundos y a 210 grados por 30 segundos.

Ejemplo 2

Los tintes de la fórmula (4) se sintetizan usando los mismos métodos descritos en el Ejemplo-1 para obtener los siguientes colorantes descritos en la tabla:

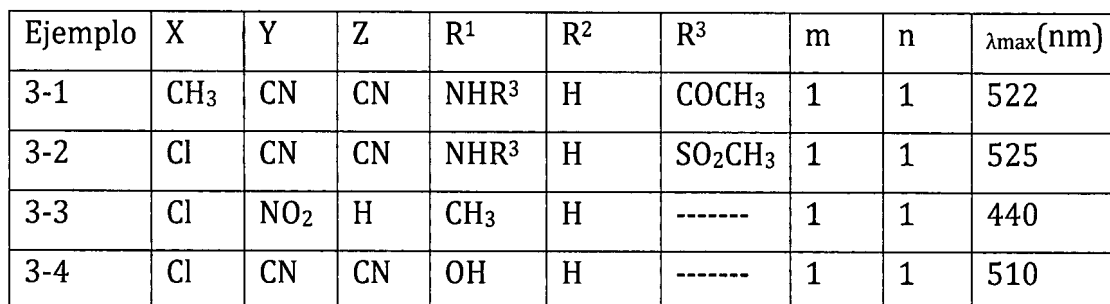


Ejemplo	Y	Z	R ¹	R ²	R ³	m	n	λ_{max} (nm)
2-1	NO ₂	H	NHR ³	H	COCH ₃	0	0	536
2-2	NO ₂	H	NHR ³	H	COCH ₃	1	1	538
2-3	NO ₂	Cl	NHR ³	H	COCH ₃	0	0	546
2-4	Cl	Cl	H	H	-----	1	1	430
2-5	Cl	Br	H	H	-----	1	1	429
2-6	CN	H	CH ₃	H	-----	1	1	523
2-7	CN	H	NHR ³	H	COCH ₃	0	0	526
2-8	Cl	H	NHR ³	H	COCH ₃	1	1	524
2-9	NO ₂	H	NHR ³	OCH ₃	COCH ₃	1	1	560
2-10	NO ₂	Br	NHR ³	OCH ₃	COCH ₃	1	1	585
2-11	CN	Br	NHR ³	OCH ₃	COCH ₃	1	1	607
2-12	Cl	Br	H	H	-----	1	2	433

Estos tintes muestran una excelente solidez al lavado, a la luz y a la sublimación.

Ejemplo-3:

Los tintes de la fórmula (2) se sintetizan usando los mismos métodos descritos en el Ejemplo-1 para obtener los siguientes colorantes descritos en la tabla:



Ejemplo-4:

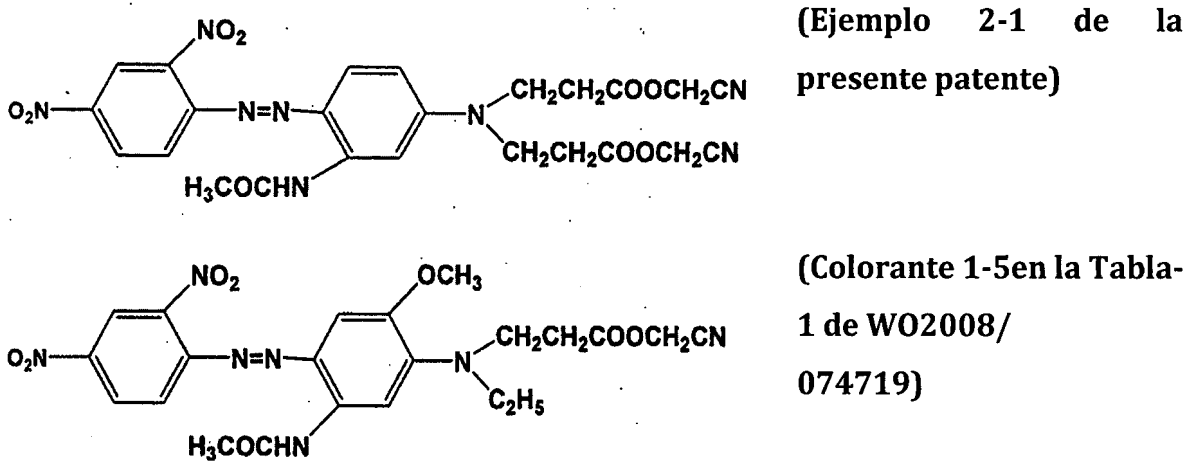
$$\begin{array}{c}
 \text{R}^2 \\
 | \\
 \text{D}-\text{N}=\text{N}-\text{C}_6\text{H}_3-\text{N}-\begin{array}{l} \text{CH}_2(\text{CH}_2)_m\text{COOCH}_2\text{CN} \\ \text{CH}_2(\text{CH}_2)_n\text{COOCH}_2\text{CN} \end{array} \\
 | \\
 \text{R}^1
 \end{array}
 \quad (1)$$

Ejemplo	D	R ¹	R ²	R ³	m	n	$\lambda_{\max}(\text{nm})$
4-1	05:06-diclorobenzotiazol	H	H	-----	1	1	515
4-2	6-nitrobenzotiazol	H	H	-----	1	1	537
4-3	6-clorobenzotiazol	NHR ³	H	COCH ₃	1	1	525
4-4	3,5-dinitro tiofeno	CH ₃	H	-----	1	1	630
4-5	6-nitrobenzoisotiazol	NHR ³	H	COCH ₃	1	1	605

Estos tintes muestran una excelente solidez al lavado, a la luz y a la sublimación.

Ejemplo comparativo 1:

Los siguientes colorantes, escritos como Colorante 1-5 y Colorante 1-38 en la Tabla-1 de WO2008/074719 son comparados en solidez al lavado y solidez a la sublimación con los colorantes escritos como el Colorante del Ejemplo 2-1 en la presente patente de la siguiente manera:



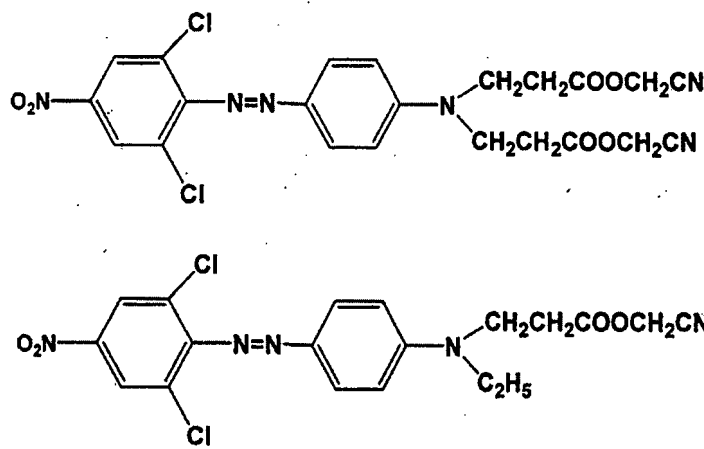
Colorante	Solidez al Lavado (WF)	Solidez a la Sublimación (SF)	Solidez a la Luz (LF)
Ejemplo 2-1 de esta patente	Clase 4	Clase 5	Clase 4-5
Colorantes comparativos 1-5 en la Tabla-1 de WO2008/074719	Clase 2-3	Clase 3-4	Clase 3-4

Solidez al lavado de acuerdo al Método de Prueba AATCC 61 2A, Solidez a la Luz de acuerdo al Método de Prueba ISO 105 B02 y la Prueba de Sublimación a 180 grados por 30 segundos y a 210 grados por 30 segundos.

El Colorante del Ejemplo 2-1 de esta patente y los colorantes comparativos 1-5 son químicos muy similares, excepto la diferencia entre el grupo etilo y C₂H₄COOCH₂CN en radical amino y grupo Metoxi no está en el Ejemplo 2-1 pero las diferencias de calidad son muy grandes, especialmente en solidez al lavado, y también en solidez a la sublimación y solidez a la luz. Este ejemplo comparativo proporciona la confirmación de que el enfoque lógico introduce dos sustituyentes C₂H₄COOCH₂CN para mejorar las

propiedades de solidez al lavado en vez de solo uno en la WO2008/074719. La introducción de dos sustituyentes C₂H₄COOCH₂CN le otorga una solidez al lavado excelente y también resulta en la mejoría de la solidez a la sublimación y solidez a la luz.

Ejemplo comparativo 2:



(Ejemplo 2-4 de la presente patente)

(Colorante 1-38 en la Tabla-1 de WO2008/074719)

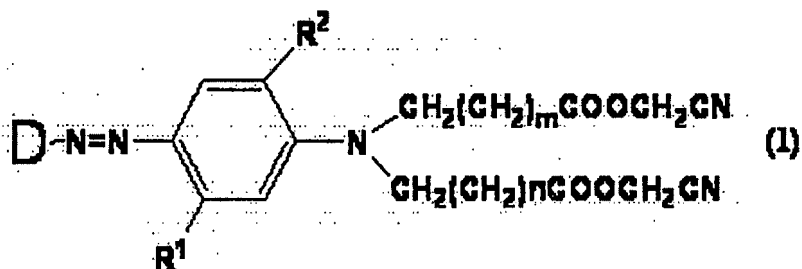
Colorante	Solidez al Lavado (WF) Método AATCC (Ny)	Solidez a la Sublimación (SF)	Solidez a la Luz (LF)
Ejemplo 2-4 de esta patente	Clase 5	Clase 5	Clase 6
Colorantes comparativos 1-38 en la Tabla-1 de WO2008/074719	Clase 2-3	Clase 3-4	Clase 5

El Colorante del Ejemplo 2-4 de esta patente y los colorantes comparativos 1-38 son químicos muy similares, excepto la diferencia entre el grupo etilo y C₂H₄COOCH₂CN en radical amino. Sin embargo, las diferencias de calidad son muy grandes, especialmente en solidez al lavado, y también en solidez a la sublimación y solidez a la luz. Este ejemplo comparativo proporciona la confirmación del enfoque lógico adoptado de usar tinte con mejores propiedades de solidez al lavado al introducir dos sustituyentes C₂H₄COOCH₂CN en vez de un C₂H₄COOCH₂CN en la WO2008/074719. Además de la mejoría en la solidez al lavado, la introducción de dos sustituyentes

$\text{C}_2\text{H}_4\text{COOCH}_2\text{CN}$ trae excelentes resultados con la mejoría en solidez a la sublimación y solidez a la luz.

REIVINDICACIONES

1. Colorantes azoicos dispersos nuevos de fórmula (I)



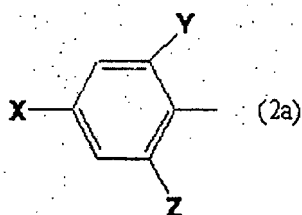
en donde,

R^1 es hidrógeno, metilo, hidroxilo o NHR^3

R^2 es hidrógeno, cloro o metoxi;

en donde,

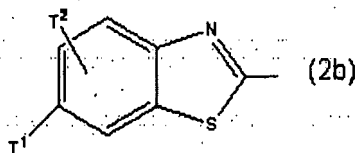
D es un grupo de la fórmula (2a)



en donde,

X, Y y Z son, independiente, hidrógeno, metilo, halógeno, ciano o nitro;

O un grupo de la fórmula (2b)

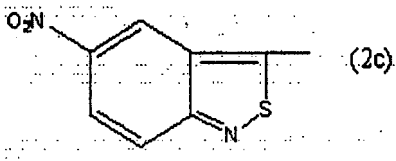


en donde,

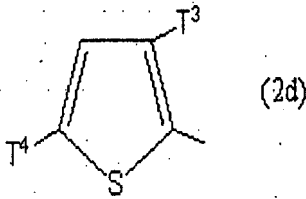
T^1 es, independientemente, hidrógeno, halógeno, nitro, $-\text{SO}_2\text{CH}_3$ o $-\text{SCN}$; y

T^2 es hidrógeno o halógeno;

O un grupo de la fórmula (2c),



O un grupo de la fórmula (2d),



en donde,

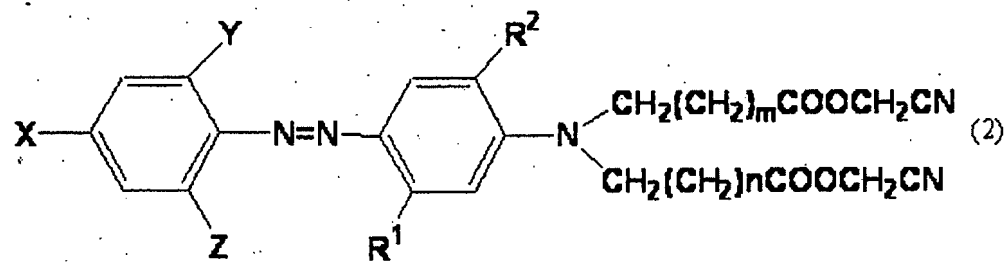
T³y T⁴son, independientemente, nitro, acetilo, COOR⁴ o ciano;

R³es -COCH₃, -COC₂H₅, -SO₂CH₃ o -SO₂C₂H₅;

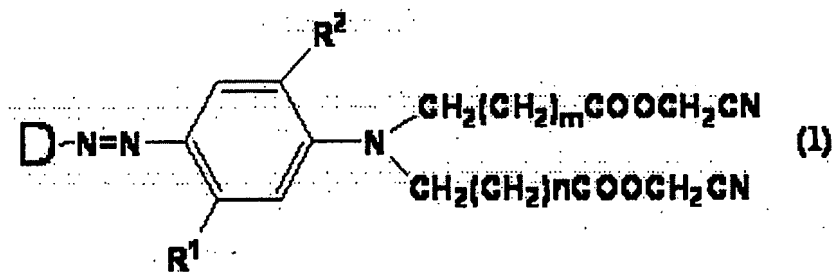
R⁴ es C₁a C₄alquilo no sustituido;

n y m son, independientemente, 0.1 o 2.

2. Colorantes azoicos dispersos nuevos de acuerdo a la reivindicación 1, en donde el compuesto de fórmula (I) es de fórmula (2):

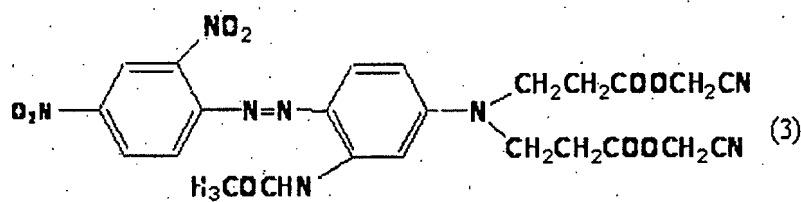


X	Y	Z	R ¹	R ²	R ³	m	n
CH ₃	CN	CN	NHR ³	H	COCH ₃	1	1
Cl	CN	CN	NHR ³	H	SO ₂ CH ₃	1	1
Cl	NO ₂	H	CH ₃	H	-----	1	1
Cl	CN	CN	OH	H	-----	1	1

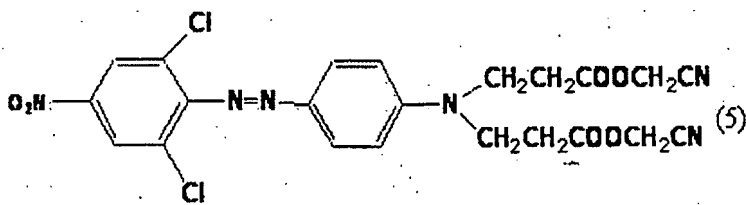


D	R ¹	R ²	R ³	m	n
5,6-diclorobenzotiazol	H	H	-----	1	1
6-nitrobenzotiazol	H	H	-----	1	1
6-clorobenzotiazol	NHR ³	H	COCH ₃	1	1
3,5-dinitro tiofeno	CH ₃	H	-----	1	1
6-nitrobenzoisotiazol	NHR ³	H	COCH ₃	1	1

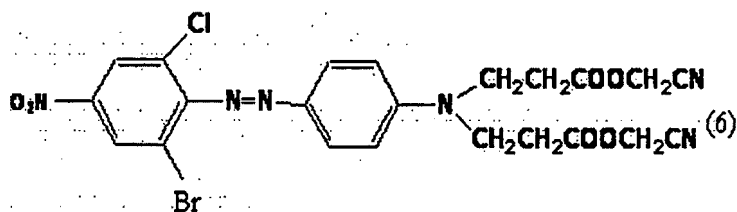
5. Colorantes azoicos dispersos nuevos de fórmula (3):



6. Colorantes azoicos dispersos nuevos de fórmula (5):



7. Colorantes azoicos dispersos nuevos de fórmula (6):



8. Una composición de colorante disperso que contiene: colorantes azoicos dispersos de Fórmula (1) como componente único o en combinación de dos o más tintes de la presente invención en una cantidad de 10 a 65% por peso de la composición de colorante, por lo menos un agente dispersante presente en una cantidad de 20% a 200% por peso de compuesto de colorante y que además comprende, de manera opcional, ingredientes tales como un surfactante o agente humectante en una cantidad de 0,1% a 20%, y antiespumantes/agente de despolvado.
9. Un proceso para preparar un colorante azoico disperso de fórmula I que incluye los siguientes pasos:
 - a) Síntesis de componente de acoplamiento;
 - b) Diazotización de amina aromática;
 - c) Acoplamiento de sal de diazonio con el componente de acoplamiento adecuado;
 - d) Fresado con los agentes dispersos adecuados, rellenos y opcionalmente agentes humectantes o surfactantes.
- 10) Material teñido que usa cualquiera de los tintes nuevos descritos en las Reivindicaciones de la 1 a la 7 como componente único o en combinación de dos o más tintes.

RESUMEN

Colorantes azoicos dispersos nuevos de fórmula (I), y procesos para la preparación de los mismos. Estos colorantes poseen una solidez al lavado, solidez a la sublimación y solidez a la luz superiores.

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference FPAA2372PCT	FOR FURTHER ACTION See Form PCT/PEA/416	
International application No. PCT/IN2010/000850	International filing date (day/month/year) 23.12.2010	Priority date (day/month/year) 23.12.2009
International Patent Classification (IPC) or national classification and IPC INV. D06P1/16		
Applicant Colourtex Industries Limited		
1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36. 2. This REPORT consists of a total of <u>7</u> sheets, including this cover sheet. 3. This report is also accompanied by ANNEXES, comprising: a. ☒ (sent to the applicant and to the International Bureau) a total of <u>17</u> sheets, as follows: ☒ sheets of the description, claims and/or drawings which have been amended and/or sheets containing rectifications authorized by this Authority, unless those sheets were superseded or cancelled, and any accompanying letters (see Rules 46.5, 66.8, 70.16, 91.2, and Section 607 of the Administrative Instructions). ☐ sheets containing rectifications, where the decision was made by this Authority not to take them into account because they were not authorized by or notified to this Authority at the time when this Authority began to draw up this report, and any accompanying letters (Rules 66.4bis, 70.2(e), 70.16 and 91.2). ☐ superseded sheets and any accompanying letters, where this Authority either considers that the superseding sheets contain an amendment that goes beyond the disclosure in the international application as filed, or the superseding sheets were not accompanied by a letter indicating the basis for the amendments in the application as filed, as indicated in item 4 of Box No. I and the Supplemental Box (see Rule 70.16(b)). b. ☐ (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing, in electronic form only, as indicated in the Supplemental Box Relating to Sequence Listing (see paragraph 3bis of Annex C of the Administrative Instructions).		
4. This report contains indications relating to the following items: ☒ Box No. I Basis of the report ☐ Box No. II Priority ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability ☐ Box No. IV Lack of unity of invention ☒ Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement ☐ Box No. VI Certain documents cited ☐ Box No. VII Certain defects in the international application ☐ Box No. VIII Certain observations on the international application		
Date of submission of the demand	Date of completion of this report	
20.10.2011	16.05.2012	
Name and mailing address of the international preliminary examining authority:	Authorized officer	
 European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Fax: +49 89 2399 - 4465	Constantinescu, R Telephone No. +49 89 2399-7017 	

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.
PCT/N2010/000850

Box No. I Basis of the report

1. With regard to the **language**, this report is based on
 - ☒ the international application in the language in which it was filed
 - ☐ a translation of the international application into , which is the language of a translation furnished for the purposes of:
 - ☐ international search (under Rules 12.3(a) and 23.1(b))
 - ☐ publication of the international application (under Rule 12.4(a))
 - ☐ international preliminary examination (under Rules 55.2(a) and/or 55.3(a) and (b))
2. With regard to the **elements*** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report):*

Description, Pages

2-6, 9-12 as originally filed
1, 7, 8 filed with telefax on 20-10-2011

Claims, Numbers

1-8 filed with telefax on 09-05-2012

- ☐ a sequence listing - see Supplemental Box Relating to Sequence Listing.
3. ☒ The amendments have resulted in the cancellation of:
 - ☐ the description, pages
 - ☒ the claims, Nos. 9, 10
 - ☐ the drawings, sheets/figs
 - ☐ the sequence listing (*specify*):
 - ☐ any table(s) related to sequence listing (*specify*):
 4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since either they are considered to go beyond the disclosure as filed, or they were not accompanied by a letter indicating the basis for the amendments in the application as filed, as indicated in the Supplemental Box (Rules 70.2(c) and (c-bis)):
 - ☐ the description, pages
 - ☐ the claims, Nos.
 - ☐ the drawings, sheets/figs
 - ☐ the sequence listing (*specify*):
 5. ☒ This report has been established:
 - ☒ taking into account the rectification of an obvious mistake authorized by or notified to this Authority under Rule 91 (Rules 66.1(d-bis) and 70.2(e)).
 - ☐ without taking into account the rectification of an obvious mistake authorized by or notified to this Authority under Rule 91(Rules 66.4bis and 70.2(e)).
 6. ☐ Supplementary international search report(s) from Authority(ies) has/have been received and taken into account in establishing this report (Rule 45bis.8(b) and (c)).

**INTERNATIONAL PRELIMINARY REPORT
ON PATENTABILITY**

International application No.
PCT/IN2010/000850

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	<u>1-8</u>
	No: Claims	
Inventive step (IS)	Yes: Claims	<u>1-8</u>
	No: Claims	
Industrial applicability (IA)	Yes: Claims	<u>1-8</u>
	No: Claims	

2. Citations and explanations (Rule 70.7):

see separate sheet

**INTERNATIONAL PRELIMINARY
REPORT ON PATENTABILITY
(SEPARATE SHEET)**

International application No.

PCT/IN2010/000850

Re Item I

Basis of the report

The amendments filed with the telefax dated 09.05.2012 under Art. 19(1) PCT: newly filed claims 1-8 do not introduce subject-matter which extends beyond the content of the application as filed.

The newly filed claim 1 excludes now, by introducing a disclaimer, the novelty-destroying examples of D1. The said disclaimer is considered allowable.

The rest of the claims are identical with the last set of claims.

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

Reference is made to the following documents:

- D1 GB 909 843 A (ICI LTD) 7 November 1962;
- D2 WO 2008/074719 A1 (DYSTAR TEXTILFARBEN GMBH & CO [DE] et al)
26 June 2008.

V.1. Novelty

V.1.1. Document D1 discloses disperse monoazo dyes of formula (I) suitable for dyeing of polyester textile materials (see D1: page 3, lines 4-42 and the claims 1-8).

The present X, Y, Z substituents are independently defined as: H, methyl, halogen, cyano or nitro.

The current proviso from present claim 1 reads as follows: when both Y and Z are simultaneously selected from methyl, halogen, cyano or nitro, then both R¹ and R² are simultaneously H. Hence, the new disclaimer excludes the dyes from examples 7, 19, 35 and 44 of D1.

Consequently, the subject-matter of claim 1 and implicitly of claim 8 is novel with respect to D1 (Art. 33(2) PCT).

V.1.2. The subject-matter of newly filed claims 2-7 is identical with the last set of claims 2-7 and appears to meet the requirements for novelty with respect to D1 (Art. 33(2) PCT).

The difference between the disperse monoazo dyes of formula (I) from D1 and the

current dyes of said claims is the specific substitution pattern: the D and E moieties of the two components in D1 are similar substituted as the present dyes, with the difference that although some rests were proposed, they were not explicitly used as in the present application (D1: page 1, lines 43-49).

Hence, the subject-matter of present claims 2-7 appears to be novel with respect to D1 (Art. 33(2) PCT).

V.2. Inventive step

V.2.1. For the present disperse monoazo dyes of formula (1) in case **both rests R¹ and R² are simultaneously Hydrogen** (and both Y and Z are simultaneously selected from methyl, halogen, cyano or nitro):

Document D1 is regarded as the closest prior art to the current claim 1 (in the upper case).

The difference between the present dyes (when then both R¹ and R² are simultaneously H) and the dyes of D1 is the specific substitution pattern of the component D from present formula (1): although some rests and their substituents were proposed, they were not explicitly used as in the present application.

The technical effect caused by the specific substitution pattern of the current claimed disperse dyes, can be seen as improved application properties: washing fastness, sublimation fastness and light fastness.

Therefore, the objective technical problem to be solved by the subject-matter of claim 1 vis à vis D1 can be seen in providing novel and alternative disperse dye derivatives with improved application properties when used for dyeing of polyester fibers.

The applicant filed comparative tests with the telefax dated 20.10.2011. The comparative example between the specific current dye 2-4 and the dye of example 19 from D1 shows an unexpected effect: better washing-, sublimation- and light-fastness of the present dye 2-4. The effect was generated only by the presence of a further Chlorine atom in the dye molecule, than in the reference dye of D1.

A further comparative example has been filed with the telefax dated 16.03.2012: the specific 4th dye from the table has been compared with the example 7 of D1. The said example shows a 5 class washing and sublimation fastness and a 4-5 class light fastness comparably to the 3 class washing fastness, 3-4 class sublimation fastness and 3-4 class light fastness of the said example 7 of D1.

For structurally close compounds in view of D1, the skilled person in the art would expect that such a small structure variation can be made without considerably altering

**INTERNATIONAL PRELIMINARY
REPORT ON PATENTABILITY
(SEPARATE SHEET)**

International application No.

PCT/IN2010/000850

the application properties. Hence, he would not expect such an improved effect as showed in the Tables from the said telefaxes.

Hence, the International Search Division is of the opinion that the subject-matter of current claim 1 and implicitly of the present claims 3, 4 and 6-8 (in the mentioned case) appears to be inventive with respect to the prior art (Art. 33(3) PCT).

V.2.2. For the present disperse monoazo dyes of formula (1) in case at least one or both rests R^1 and R^2 are not Hydrogen:

The subject-matter of present claim 1 (when at least one or both rests R^1 and R^2 are not Hydrogen):

Document D1 is regarded as the closest prior art to the current claim 1 (in the said case).

For the present disperse monoazo dyes of formula (1) in case at least one or both rests R^1 and R^2 are not Hydrogen:

The difference between the said dyes and the dyes of D1 is: current substitution pattern of the present dyes has been proposed in D1, however not explicitly used.

It can be seen from the current examples that the application properties of the compounds (in the upper mentioned case) are comparably better than the application properties of the prior art: they show higher fastness levels (better washing-, sublimation- and light-fastness). See the comparative test from Table 1 of the telefax dated 20.10.2011, between the dye from current example 2-8 and the dye from example 19 of D1, which differ in the R^1 rest which is NHCOCH_3 in the present dye, while in D1: $R^1 = \text{H}$.

A further comparative example has been filed with the telefax dated 09.05.2012: the the specific current dye 4-6 has been compared with the example 44 of D1. The present example 4-6 shows again improved washing-, sublimation- and light-fastness, which are introduced only by the presence of a methyl rest (which is equivalent to the present rest R^1).

Therefore, the objective technical problem to be solved by the subject-matter of claim 1 (in the mentioned case) vis à vis D1 can be seen in providing alternative novel disperse azo dyes with good to improved application properties.

Neither D1, nor other prior art document like D2, disclose or suggest that such a specific combination of substituents, wherein a particular combination of rests on the coupling component (at least one of the two substituents is not H) combined with the

**INTERNATIONAL PRELIMINARY
REPORT ON PATENTABILITY
(SEPARATE SHEET)**

International application No.

PCT/IN2010/000850

specific $-N[CH_2(CH_2)_{n \text{ or } m}COOCH_2CN]_2$ moiety would lead to disperse dyes with such unexpected and improved application properties.

D2 discloses mixtures of disperse dyes, wherein the main component are the dyes of formula (I) useful for dyeing of synthetic materials or as inks for inkjet printing.

The only difference between the monoazo dyes of D2 and the current dyes of present claim 1 is the specific substitution pattern of the coupling component: the substituted amino rest of D2 has only one rest of the type Ak-COO-Ak-CN on the amino-rest of the coupling component, instead of two of the said rests, like in the current claim 1.

Current application gives comparative examples (present pages 10-12) to the dyes I-5 and I-38 from table 1 of D2. Again, the comparative examples emphasize improved application properties of the present dyes comparative to the cited examples of D2 (better washing-, sublimation- and light-fastness).

Hence, the subject-matter of the present claim 1 (for the said case) and implicitly of claims 2-5 and 8 appears to be inventive with respect to Art. 33(3) PCT.

Printed: 11-05-2012

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European Patent Office
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Via Fax & Courier
00 49 89 2399 4465

October 20, 2011

Dear Sirs

Re : **RESPONSE TO THE WRITTEN OPINION UNDER ARTICLE 34**

PCT International Application No. PCT/IN2010/000850

International Filing Date: December 23, 2010

Applicant: COLOURTEX INDUSTRIES LIMITED

Title: "DISPERSE AZO DYES"

Priority: 2979/MUM/2009 dated 23-12-2009

Agents' File Ref.: FPAA2372PCT

Please refer to the Written Opinion of date of mailing July 6, 2011 issued by the ISA, EPO on the above application. The written opinion has mentioned that the present application lacks novelty and inventive step and the applicants respectfully disagree with the finding of the written opinion and submits as under:

With respect to objections raised under Item V, it is respectfully submitted that the claims have been amended as stated below:

It is respectfully submitted that the present invention provides disperse azo dyes of formula I with excellent overall fastness properties particularly light fastness and washing fastness on polyester fibers. It is respectfully submitted that none of the prior art discloses compounds covered by the scope of formula I of the present invention with substituents R^1 - R^4 , X-Z and T^1 - T^4 as described therein. The claims had been amended under Article 19. It is respectfully submitted that none of compounds in examples 7, 19, 35 and 44 of D1 disclose the compounds covered by the formula I of the present claim 1.

It is further respectfully submitted that the novelty of Claims 2-7 have been acknowledged by the examining authority.



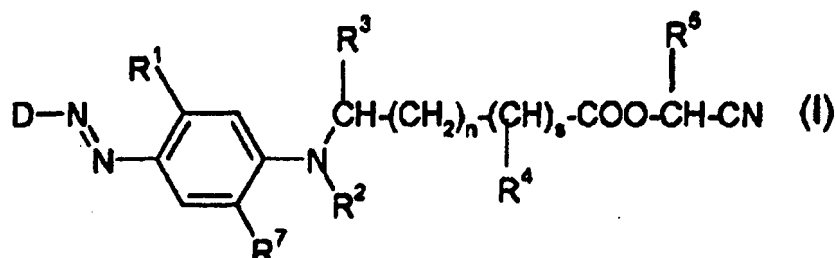
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- 2 -

The present claim 1 is outside the scope of D1 and the substituents as taught in D1 does not motivate a person skilled in the art to arrive at the present invention. It is further respectfully submitted that D1 is now acknowledged in the prior art. It is submitted that the dyes of the present application provides improved light fastness, washing fastness and sublimation fastness compared to the dyes disclosed in D1.

With respect to objections raised under Item V.2, it is respectfully submitted that:

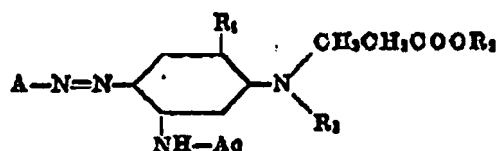
D2 provides teachings with regards to compounds of the formula



wherein

R^2 is unsubstituted ($\text{C}_1\text{-C}_6$)-alkyl, substituted ($\text{C}_1\text{-C}_6$)-alkyl, benzyl or phenylethyl;

D3 provides teachings with regards to compounds of the formula



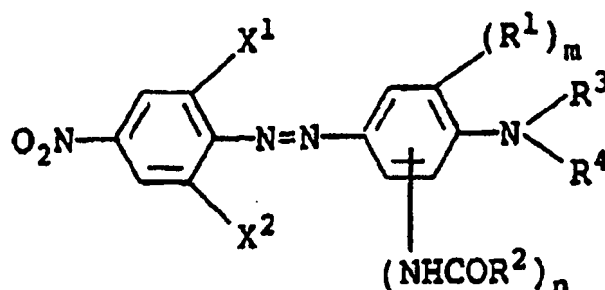
wherein R_2 is selected from the class consisting of hydrogen, cyanoethyl, $\text{-CH}_2\text{CH}_2\text{COOC}_n\text{H}_{2n+1}$, wherein n is an integer of 1-5.

D4 provides teachings with regards to compounds of the formula



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- 3 -



wherein each of R3 and R4 are independent of each other, is alkyl, cyanoalkyl or alkylcarbonyloxyalkyl.

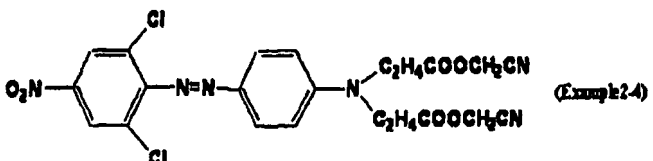
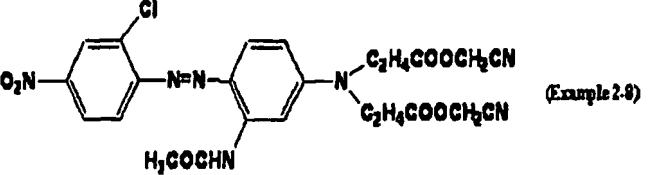
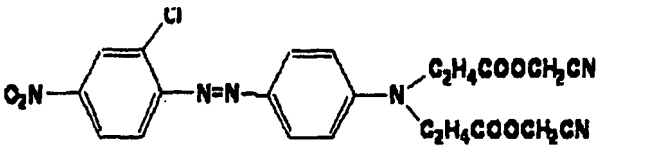
It is respectfully submitted that none of the prior art D2 to D4 provides teachings with the compound of Formula I as disclosed in the present invention.

It is further respectfully submitted that the applicant respectfully disagrees with the written opinion that the present invention is a result of little changes between the dyes of D1 and D2-D4. It is further respectfully submitted that in organic chemistry even a little change can bring about enormous changes in the activity of the molecule and such improvement in activity is also evident from the comparative examples provided in the present application.

In order to further distinguish the present invention from the prior art the applicant provides the following data.

Compound in example 19 of D1 has been prepared according to D1. The compound has been compared with the compounds of the present invention with respect to color fastness. The results are depicted in the following Table 1.

Table 1

Dye	Washing fastness (WF) AATCC method (Ny)	Sublimation fastness (SF)	Light fastness (LF)
Example 2-4 of the present application  (Example 2-4)	5 class	5 class	4-5 class
Example 2-8 of the present application  (Example 2-8)	5 class	5 class	4-5 class
Dye according to example 19 of GB 909843 	3 class	4 class	3-4 class

The applicant respectfully submits that it is evident from Table 1 that a change in substituent in the phenyl ring, compared to that of the prior art (D1) results in superior color fastness in the dyes of the present invention.

The applicant respectfully submits that comparative examples 1 and 2 provided in the specification shows that the dye of the present invention have superior Washing fastness, sublimation fastness and light fastness compared to dyes I-5 and I-38 of D2.

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- 5 -

The comparative examples 1 and 2 in the present application and the above data, clearly points out the superior fastness properties achieved due to the use of the specific substituents at specific positions in Formula I. Dyes disclosed in D1 were unable to provide solutions to the highly sophisticated micro fiber blends. In the present invention, the inventors have developed coupling components having substitution at 3-position of two β -Carbo(cyanomethoxy)ethyl substituent and also used variations in diazo components having 2:6 disubstitution to provide superior properties to the final dyestuff.

In view of the above amendments the applicant believes that the present application is novel and inventive over the prior art.

With respect to objections raised under Item VII, it is respectfully submitted that D1 has been now been acknowledged in the description in page 1. D1 is differentiated from the present application by the comparison provided in the above Table 1 wherein the advantages of the present invention over D1 are provided. In general present invention provides superior fastness to Dry heat, Light and washing. Present invention is specifically aimed to provide solution for highly sophisticated micro blends.

With respect to objections raised under Item VIII, it is respectfully submitted that the claims had been amended under Article 19. Claims 5-7 provide specific embodiments of Formula I claimed in claim 1. The claims 5-7 have therefore been amended and made dependent on claim 1. Claim 4 has been further amended. Further corrections with regards to R3 have been made in the claims that had been submitted under Article 19. R3 relates to substituents present on R1 (specifically the NHR3 substituent on page 13 Claim 1) which is a substituent on Formula I. The claims have been amended to insert the substitution of R3 at the relevant paragraphs.

The symbol "J" has been replaced with "Z" in claim 3. Relevant corrections have been made on page 7 and 8 of the description.

To emphasize novel and inventive features and bring about more clarity claims are amended as enclosed. The amendments do not go beyond the original disclosure.



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- 6 -

The said amendment kindly be regarded as amendment under Article 34. In view of the aforesaid, a favorable International Preliminary Examination Report is respectfully requested. In the event that the Examining Division is unable to issue a favorable report so requested, the applicants hereby requests a second Written Opinion to address any outstanding objections. In the event the Examining Division does not consider issuing a second Written Opinion, the applicant hereby requests an informal communication under Rule 66.6 with prior confirmation.

Sincerely yours

DR. SANCHITA GANGULI
Of S. MAJUMDAR & CO.
Applicants' Agent

Encl. Amended text pages 1, 7 and 8.

DISPERSE AZO DYES**FIELD OF THE INVENTION**

The present invention relates to novel disperse dyes and its use thereof.

BACKGROUND OF THE INVENTION

5 Traditionally, disperse dyes are used for dyeing synthetic fibers and its blend with other fibers such as cellulose, polyurethane, nylon and wool by usual exhaust dyeing, continuous dyeing and printing techniques.

Recently with changing trends, fashion and market requirement consumption of blended fabrics is significantly increased. These new fabrics are made out of micro size fiber
10 using fine denier polyester fiber or blending fiber with polyurethane, nylon and wool. The fastness properties of these new colored fabrics become worse in light fastness and sublimation fastness, particularly washing fastness when dyed or printed with conventional disperse dyes. The fastness properties worsen due to thinning of dyed fiber by using fine denier polyester fiber or blending fiber with polyurethane, nylon and wool.
15 The excellent dyestuff to endure this use is desired in this dyeing and printing field.

IN190551 and its divisional patents IN197577 and IN196765 disclose monoazo dyes containing fluorosulphonyl group. The aforesaid Indian Patents disclose process for colouring synthetic textile material or fiber blend.

The patent application 2162/KOLNP/2009 which is published as WO 2008/074719
20 discloses disperse dye mixture comprising (a) two or more disperse dyestuffs of the formula (I). GB 909843 also discloses novel azodyes. However the dyes disclosed in GB 909843 are unable to provide solutions to the highly sophisticated micro fiber blends.

Thus the prior art discloses azo dye compounds and process for preparation, however does not impart excellent fastness properties particularly Light Fastness and Washing
25 Fastness properties.

OBJECTS OF THE INVENTION

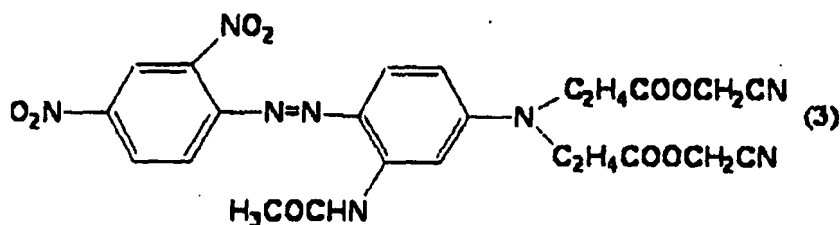
It is an object of the present invention to provide yellow, red and blue disperse azo dyes.

The preparation of Dye stuff of formula 1 comprises the following steps:

- a) Synthesis of coupling component;
- b) Diazotization of aromatic amine;
- c) Coupling of diazonium salt with suitable coupling component;
- 5 d) Milling with suitable disperse agents, fillers and optionally wetting agents or surfactants.
- e) Use it as liquid or spray dry to get final powder sample.

Example-1:

Structural formula (3)



The example 1 of structural formula (3) is synthesized in the following method.

Acrylic acid 20.0 g is added into the mixture of DMF (N,N-dimethylformamide) 40.0g and 3-amino acetanilide 15g and heated to 80°C and maintain under continues stirring for 2 hours. After completion of reaction, Chloroacetonitrile (cyanomethylchloride) 19.4 g are added into the reaction mass and heated to 80°C and maintain under continues stirring for 2 hours. On completion of reaction this reaction mass which contains 35 g of this coupler is used for next coupling reaction.

30 ml of 40%nitrosylsulfuric acid is added to the mixture of 19.4 g 2, 4 -dinitro aniline and 50ml sulfuric acid at 0-5°C and stirred for 2hr below 5°C. After 2 hrs this diazonium salt solution is added to the pre-charged mixture of Ice, water and 35 g of Coupler, N, N-dicyanomethoxycarbonyl-3-acetoamideaniline at 0-5°C. The reaction mass is stirred for 1 hr below 5°C and filtered. The crystal solid is then washed with chilled water to get

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90% yield of the Dyestuff of formula (3). The $\lambda_{\max}$ (in acetone) of the dyestuffs of formula (3) is 536 nm.

2.0 g of the obtained wet press cake is milled with 2.0 g of naphthalenesulfonic acid-formaldehyde condensate and 50 g of water and 500 g of glass beads (average size is 0.8 mm of diameter.) for 24 hr and after milling, the mass is filtered to separate glass beads.

20 g of the obtained finished liquid is added in 100 ml of water and pH adjusted to 4 with acetic acid. 10 g piece of polyester is added into the dye bath for exhaust dyeing.

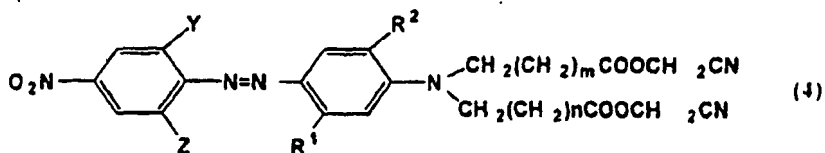
The dyeing bath is heated to 135°C and kept for 40 minutes. After proper rinsing, washing and drying, the dyed material gives deep Rubine shade with excellent washing fastness, light fastness and sublimation fastness.

Fastness properties of the dyed fabrics are evaluated by following test method.

Washing Fastness as per Test Method AATCC 61 2A, Light Fastness as per Test Method ISO 105 B02 and Sublimation Test at 180° for 30 sec and at 210° for 30 sec.

Example 2

- 15 The dyestuffs of the formula (4) are synthesized using same methods described in Example-1 to get following dyes described in table:



Example	Y	Z	R ¹	R ²	R ³	m	n	$\lambda_{\max}(\text{nm})$
2-1	NO ₂	H	NHR ³	H	COCH ₃	0	0	536
2-2	NO ₂	H	NHR ³	H	COCH ₃	1	1	538
2-3	NO ₂	Cl	NHR ³	H	COCH ₃	0	0	546
2-4	Cl	Cl	H	H		1	1	430

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 The International Preliminary Examining Authority
 European Patent Office
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Via Fax & Courier
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May 9, 2012

Dear Sir,

Re: **RESPONSE TO THE 3rd WRITTEN OPINION UNDER RULE 66.3**

PCT International Application No. PCT/IN2010/000850

International Filing Date: December 23, 2010

Applicant: COLOURTEX INDUSTRIES LIMITED

Title: "DISPERSE AZO DYES"

Priority: 2979/MUM/2009 dated 23-12-2009

Agents' File Ref.: FPAA2372PCT

Please refer to the Written Opinion date of mailing April 25, 2012 issued by the IPEA, EPO, which was faxed to us by the IPEA, EPO on April 26, 2012 on the above application. The written opinion has mentioned that the present application lacks novelty and inventive step and the applicants respectfully disagree with the finding of the written opinion and submits as under:

Under Item V, reference has been made to one document namely D1 (GB909843).

With respect to objections raised under Item V.1.1 specifically with regards to D1, it is respectfully submitted that the claims have been amended as stated below:

It is respectfully submitted that in view of the amended claims, the compound in example 44 of D1 does not disclose the compounds covered by the formula I of the present claim 1.

The present claim 1 and implicitly claim 8 is outside the scope of D1 and the substituents as taught in D1 does not motivate a person skilled in the art to arrive at the present invention.

It is further respectfully submitted that the novelty of Claims 2-7 have been acknowledged by the examining authority under Item V.1.2.

With respect to objections raised under Item V.2, it is respectfully submitted that the applicant's main focus is to provide solution for micro fiber polyester and spandex dyeing with excellent fastness properties. D1 does not mention properties on micro fiber polyester or spandex. For all comparative examples, the present invention has studied these properties on micro fiber polyester.

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-2-

With reference to paragraph V.2.1, it is noted that V.2.1 admits inventive step for the dyes of formula (1):

- i. when both rests R^1 and R^2 are simultaneously hydrogen and both Y and Z are simultaneously halogen;
- ii. at least one or both rests R^1 and R^2 are not hydrogen.

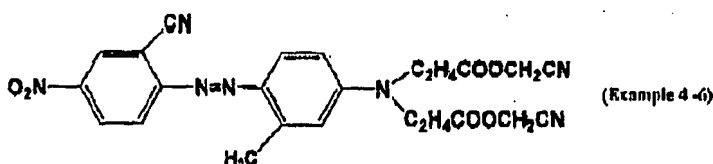
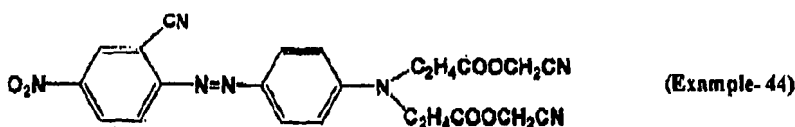
With respect to objections raised under Item V.2.2, it is respectfully submitted that with the inclusion of the proviso in the amended claim 1 filed along with this response viz

"Only when both Y and Z are simultaneously selected from methyl, halogen, cyano or nitro, then both R^1 and R^2 are simultaneously hydrogen,"

the present claim 1 and implicitly claim 8 is outside the scope of D1. Further the substituents as taught in D1 do not motivate a person skilled in the art to arrive at the present invention.

The Comparative example below is illustrative of the fact that the compounds covered by present claim 1 are inventive.

Example 44 quoted in the UK patent No.909,843



Dye	Washing fastness (WF) AATCC method (Ny)	Sublimation fastness (SF)	Light fastness (LF)
Example 44 of GB909843	4 class	3-4 class	3-4 class
Example 4-6 of the present invention	4-5 class	4 class	4-5 class

It is respectfully submitted that compound 44 as disclosed in D1 achieves only 4 Class Washing fastness, 3-4 Sublimation fastness and lightfastness where as with different substitution as claimed in present claim 1, up to 4-5 class washing fastness, 4 class of Sublimation fastness and 4-5 class of light fastness is achieved. Moreover, pH stability of Example 44 of D1 is at pH 6 against pH 4.5 is 30% whereas with different substitution in example 4-6 it is achieved up to 60% pH stability at pH 6 against pH 4.5 which is remarkable difference which improves application performance.



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-3-

Marked_up copy of the amended claims pages 13 to 17 are also enclosed herewith.

In view of the above amendments the applicant believes that the present application is novel and inventive over the prior art.

The said amendment kindly be regarded as amendment under Written Opinion according to Rule 66.3. In view of the aforesaid, a favorable International Preliminary Examination Report is respectfully requested. In the event that the Examining Division is unable to issue a favorable report so requested, the applicants hereby requests a further Written Opinion to address any outstanding objections. In the event the Examining Division does not consider issuing a further Written Opinion, the applicant hereby requests an informal communication under Rule 66.6 with prior confirmation.

Sincerely yours

Sanchita Ganguli

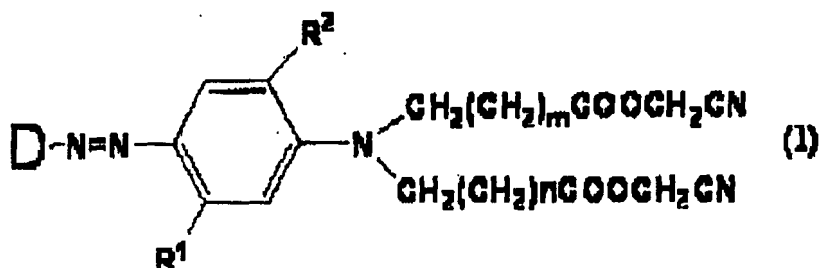
DR. SANCHITA GANGULI
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- Encl. 1) Amended claims pages 13 to 17 (clean copy).
2) Amended claims pages 13 to 17 (marked-up copy).

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CLAIMS

1. Novel Disperse azo dyes of formula (1)



wherein,

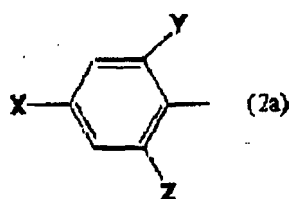
R^1 is hydrogen, methyl, hydroxyl or NHR^3 ;

R^3 is $-COCH_3$, $-COC_2H_5$, $-SO_2CH_3$ or $-SO_2C_2H_5$;

R^2 is hydrogen, chloro or methoxy;

wherein,

D is a group of the formula (2a)



wherein,

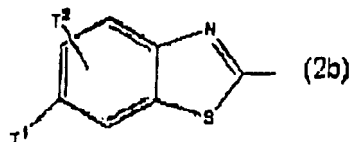
X, Y and Z are, independently, hydrogen, methyl, halogen, cyano or nitro;

with the proviso:

Only when both Y and Z are simultaneously selected from methyl, halogen, cyano or nitro, then both R^1 and R^2 are simultaneously hydrogen;

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Or a group of the formula (2b),



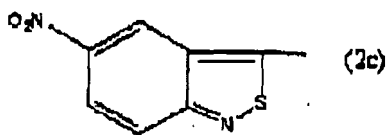
wherein,

T¹ is independently halogen or nitro,T² is hydrogen or halogen;

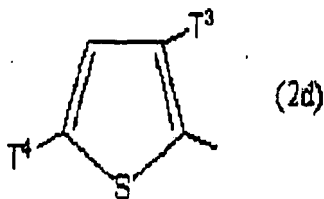
with the proviso:

When, T¹ is Nitro, T² is not hydrogen;

Or a group of the formula (2c),



Or a group of the formula (2d),



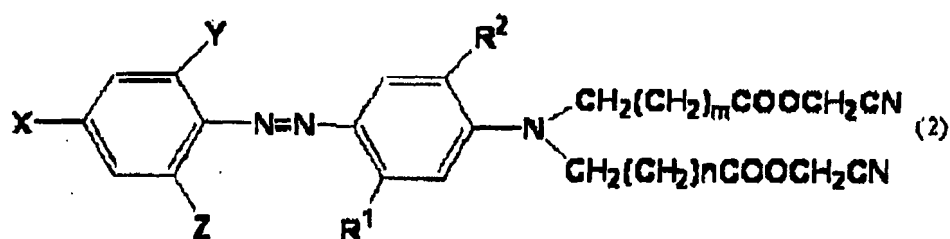
wherein,

T³ and T⁴ are independently nitro, acetyl, COOR⁴ or cyano;R⁴ is C₁ to C₄ unsubstituted alkyl;

n and m are independently 0, 1 or 2.

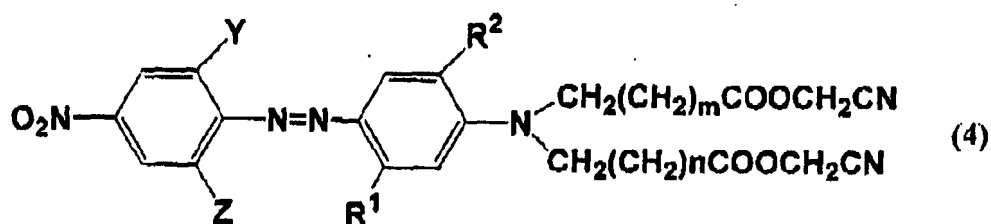
2. Novel disperse azo dyes according to claim 1 in which the compound of formula (1) is of formula (2):

15



X	Y	Z	R ¹	R ²	R ³	m	n
CH ₃	CN	CN	NHR ³	H	COCH ₃	1	1
Cl	CN	CN	NHR ³	H	SO ₂ CH ₃	1	1
Cl	NO ₂	H	CH ₃	H	-----	1	1
Cl	CN	CN	OH	H	-----	1	1

3. Novel disperse azo dyes according to claim 1 in which the compound of formula (1) is of formula (4):

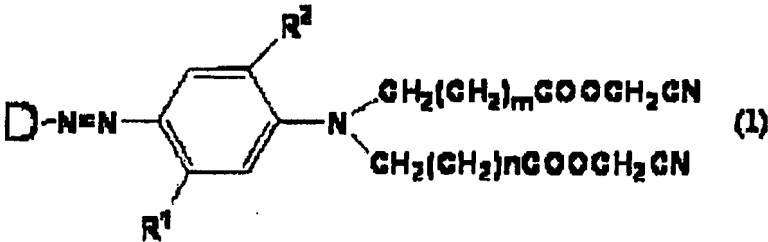


Wherein,

Y	Z	R ¹	R ²	R ³	M	n
NO ₂	H	NHR ³	H	COCH ₃	0	0
NO ₂	H	NHR ³	H	COCH ₃	1	1
NO ₂	Cl	NHR ³	H	COCH ₃	0	0

Cl	Cl	H	H	-----	1	1
Cl	Br	H	H	-----	1	1
CN	H	CH ₃	H	-----	1	1
CN	H	NHR ³	H	COCH ₃	0	0
Cl	H	NHR ³	H	COCH ₃	1	1
NO ₂	H	NHR ³	OCH ₃	COCH ₃	1	1
NO ₂	Br	NHR ³	OCH ₃	COCH ₃	1	1
CN	Br	NHR ³	OCH ₃	COCH ₃	1	1

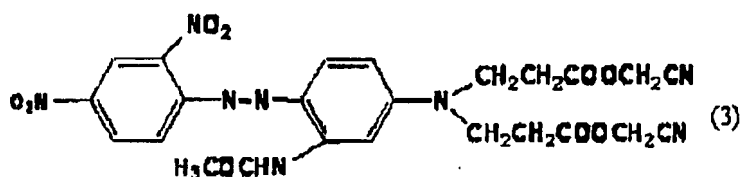
4. Novel disperse azo dyes according to claim 1 in which the compound of formula (1) is:



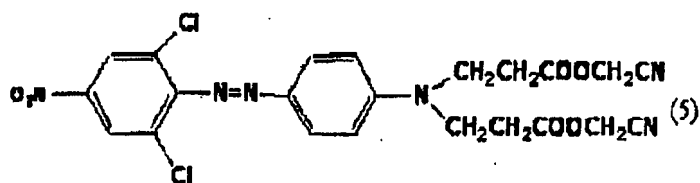
D	R ¹	R ²	R ³	m	n
5,6-dichloro Benzothiazole	H	H	-----	1	1
6-chlorobenzo-Thiazole	NHR ³	H	COCH ₃	1	1
3,5-dinitro-Thiophene	CH ₃	H	-----	1	1
6-nitrobenzo-Isothiazole	NHR ³	H	COCH ₃	1	1

5. Novel disperse azo dyes according to claim 1 designated as formula (3):

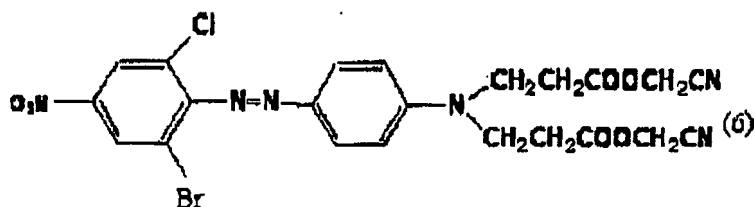
17



6. Novel disperse azo dyes according to claim 1 designated as formula (5):



7. Novel disperse azo dyes according to claim 1 designated as formula (6):



8. A disperse dye composition comprising: disperse azo dyes of Formula (1) as single component or in combination of two or more dyestuffs of the present invention in an amount of from 10 to 65% by weight of the dye composition, at least one dispersing agent present in an amount 20% to 200% by weight of dye compound and optionally additionally comprising ingredients such as a surfactant or wetting agent in an amount 0.1% to 20%, and defoamers / dedusting agent.

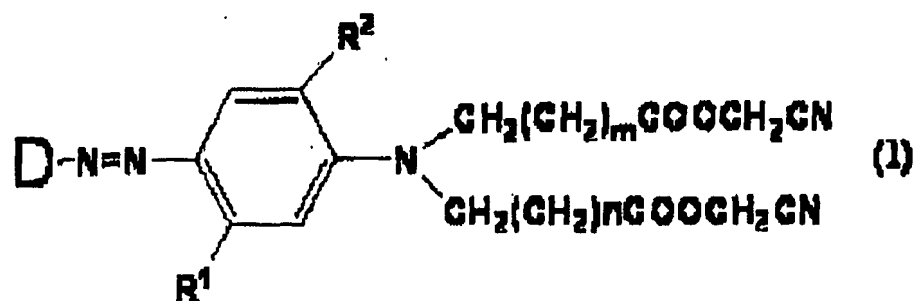
REIVINDICACIONES MODIFICADAS

PARA REALIZAR EL EXAMEN DE

PATENTABILIDAD

REINVINDICACIONES

1. Colorantes azoicos dispersos nuevos de fórmula (1)



en donde,

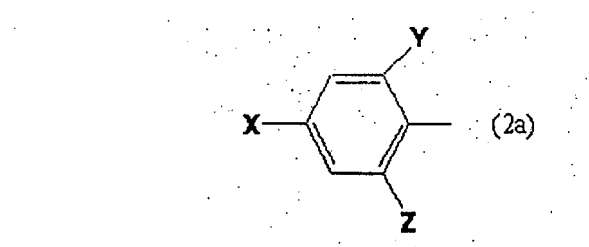
R¹ es hidrógeno, metilo, hidroxilo o NHR³;

R³ es -COCH₃, -COC₂H₅, -SO₂CH₃ o -SO₂C₂H₅;

R² es hidrógeno, cloro o metoxi;

en donde,

D es un grupo de fórmula (2a)



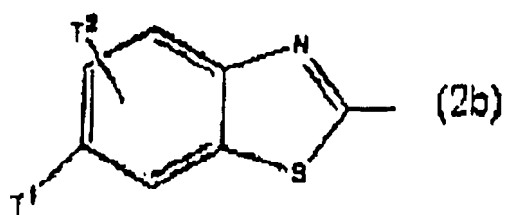
en donde,

X, Y, y Z son, independientemente, hidrógeno, halógeno, ciano o nitro;

con la condición:

Sólo cuando Y y Z sean seleccionados simultáneamente de metilo, halógeno, ciano o nitro, entonces R¹ y R² serán simultáneamente hidrógeno;

O un grupo de la fórmula (2b),



en donde,

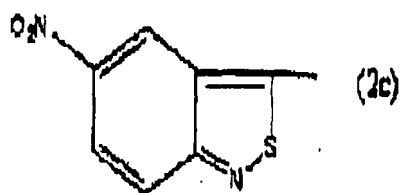
T¹ es independientemente halógeno o nitro,

T² es hidrógeno o halógeno;

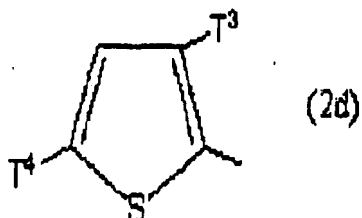
con la condición:

Cuando, T¹ es Nitro, T² no es hidrógeno;

O un grupo de la fórmula (2c),



O un grupo de la fórmula (2d),



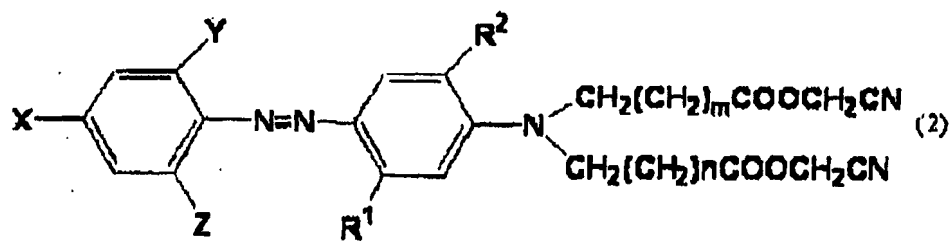
en donde,

T³ y T⁴ son independientemente nitro, acetilo, COOR⁴ o ciano;

R⁴ es alquilo no sustituido C₁ a C₄;

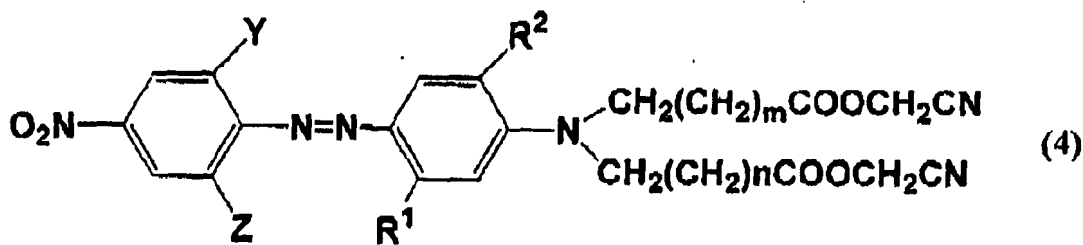
n y m son independientemente 0, 1, o 2.

2. Colorantes azoicos dispersos nuevos de acuerdo a la reivindicación 1 en donde el compuesto de fórmula (1) es de fórmula (2):



X	Y	Z	R ¹	R ²	R ³	M	n
CH ₃	CN	CN	NHR ³	H	COCH ₃	1	1
Cl	CN	CN	NHR ³	H	SO ₂ CH ₃	1	1
Cl	NO ₂	H	CH ₃	H	-----	1	1
Cl	CN	CN	OH	H	-----	1	1

3. Colorantes azoicos dispersos nuevos de acuerdo a la reivindicación 1, en donde el compuesto de fórmula (1) es de fórmula (4):

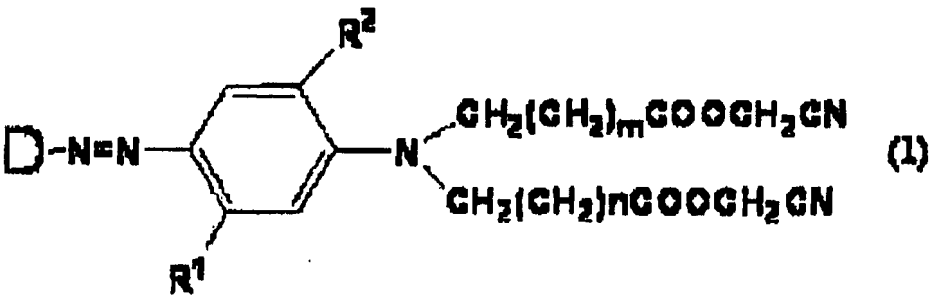


En donde,

Y	Z	R ¹	R ²	R ³	M	n
NO ₂	H	NHR ³	H	COCH ₃	0	0
NO ₂	H	NHR ³	H	COCH ₃	1	1
NO ₂	Cl	NHR ³	H	COCH ₃	0	0
Cl	Cl	H	H	-----	1	1
Cl	Br	H	H	-----	1	1
CN	H	CH ₃	H	-----	1	1
CN	H	NHR ³	H	COCH ₃	0	0

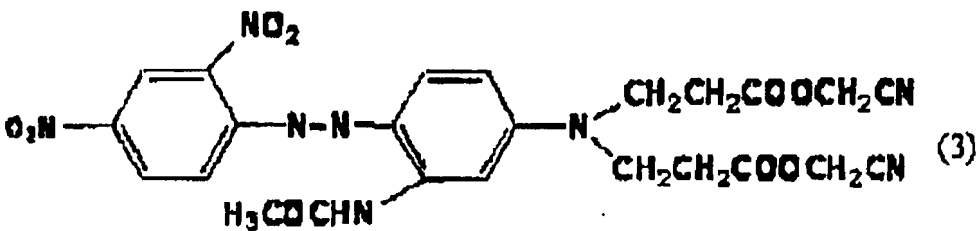
Cl	H	NHR ³	H	COCH ₃	1	1
NO ₂	H	NHR ³	OCH ₃	COCH ₃	1	1
NO ₂	Br	NHR ³	OCH ₃	COCH ₃	1	1
CN	Br	NHR ³	OCH ₃	COCH ₃	1	1

4. Colorantes azoicos dispersos nuevos de acuerdo a la reivindicación 1 en el que el compuesto de fórmula (1) es:

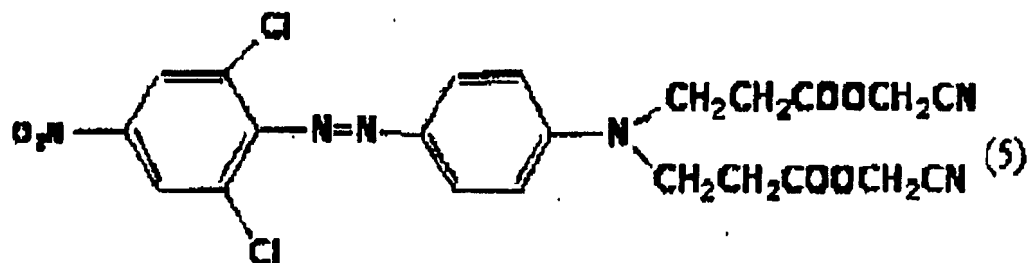


D	R ¹	R ²	R ³	m	n
5,6-diclorobenzotiazol	H	H	-----	1	1
6-clorobenzotiazol	NHR ³	H	COCH ₃	1	1
3,5-dinitro tiofeno	CH ₃	H	-----	1	1
6-nitrobenzotiazol	NHR ³	H	COCH ₃	1	1

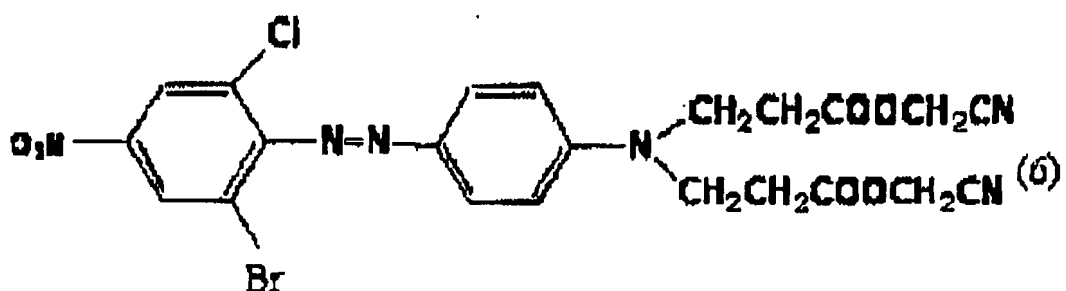
5. Colorantes azoicos dispersos nuevos de acuerdo a la reivindicación 1 designados como fórmula (3):



6. Colorantes azoicos dispersos nuevos de acuerdo a la reivindicación 1 designados como fórmula (5):



7. Colorantes azoicos dispersos nuevos de acuerdo a la reivindicación 1 designados como fórmula (6):



8. Una composición de colorante disperso que comprende: colorantes azoicos dispersos de la Fórmula (1) como un componente simple o en combinación de dos o más tintes de la presente invención en una cantidad entre 10 y 65% por peso de la composición del colorante, por lo menos un agente de dispersión presente en una cantidad de entre 20% y 200% por peso del compuesto de colorante y que opcionalmente comprende ingredientes tales como agentes surfactantes o de humedecimiento en una cantidad de entre 0,1% y 20% y un agente antiespumante/desempolvante.



Industria y Comercio
SUPERINTENDENCIA

Espacio reservado para el adhesivo de radicación

DELEGATURA PARA LA PROPIEDAD INDUSTRIAL
FORMULARIO PARA OTORGAR PODER A ABOGADO
EN LOS TRÁMITES DE PROPIEDAD INDUSTRIAL

1. Datos del otorgante

☐ Persona Natural

☒ Persona Jurídica

Nombre o denominación/Razón Social completa(En caso de que haya más de un solicitante, relaciónese en hoja adjunta)

COLOURTEX INDUSTRIES LIMITED

Nombre del Representante **Dr. Pankajkumar Dinakarraí Desai**

Nacionalidad/País de constitución	Dirección del otorgante	
India	Survey No 91, Paikée Bhestan, Navasari-Surat Road, Surat 395 023, Gujarat, India	
Dirección Electrónica	No. Fax	Número Telefónico
cavelier@cavelier.com	2118650	3473611

2. Datos del Apoderado

Principal	35.456.344	23.555
Luz Clemencia Suárez de Páez		
Primer Suplente	39.787.682	73.366
Nidia Osorio López		
Segundo Suplente	79.524.634	71.027
Oscar Corréa Barbosa		

Apellidos y Nombre Documento de Identificación T.P.(sólo abogados Profesionales)

Nacionalidad/País de constitución	Dirección del otorgante	
Colombiana	Carrera 4 No. 72-35, Bogotá, Colombia	
Dirección Electrónica	No. Fax	Número Telefónico
patentescavelier@cavelier.com	2118650	3473611

☐ Autorizo expresamente a la Superintendencia de Industria y Comercio para que todas las comunicaciones sean

3. Actuaciones en cuestión:

Este poder concierne:

☒ Todas las solicitudes y/o registros actuales y futuros del otorgante.☐ La(s) siguiente(s) solicitud(es) y/o registro(s):

NOMBRE	NÚMERO DE SOLICITUD O REGISTRO

Nota: Si el espacio anterior no es suficiente, por favor relacione las actuaciones en hoja anexa.

4. Alcance del poder:

☒ Confiero expresamente al (los) apoderado(s) todas las facultades legales para que represente mi(s) interés(es) en la(s) actuación(es) señalada(s) en el punto 3 de este documento, incluyendo:

- ☒ Desistir de la(s) solicitud(es) y de la demás actuaciones
- ☒ Renunciar a los derechos del registro de signos distintivos o de nuevas creaciones
- ☒ Transigir
- ☒ Recibir
- ☒ Conciliar
- ☒ Ratificar los actos de agentes oficiosos

5. Firma

Dr. Pankajkumar Dinkarrao Desai
Nombre del Firmante

SURAT
C.C.



La Clementina García
Firma del Apoderado

TP-23555655
Tarjeta Profesional

SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO
NIT : 800.176.089-2
- / -

Industria y Comercio SUPERINTENDENCIA	RECIBO DE CAJA	No. 12 - 0071484
		Bogotá D.C., Julio 13 de 2012 - 13:11:36

RECIBIDO DE : CAVELIER ABOGADOS	NI 860.041.367
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*** Soporte del Pago ***					
TIPO PAGO	BANCO	CUENTA	No. PAGO	FECHA PAGO	VR. PAGO
CONSIGNACION	BANCO DE BOGOTA	062754387	446258680	13/07/2012	51.725.000.00

*** Conceptos Pagados ***			
CANT. RENTISTICO	CONCEPTO	Vr. UNDITARIO	Vr. CONCEPTO
1 50005-01-01 SOLICITUDES	1 TRAMITES DE SOL. DE PATENTE DE INVENCIÓN	590.000.00	590.000.00
			\$590.000.00

SON: **QUINIENTOS NOVENTA MIL PESOS MONEDA CORRIENTE**

Responsable: _____
Recibo de Caja Aplicado al Expediente No. _____

SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO



No. 12-123158- -00000-0000

Fecha: 2012-07-23 16:41:34 Dep. 2020 DIR.NUEVASCR
Tra. 11 PATENTEIYII Eve. 379 FASENACIONALII
Act. 411 PRESENTACION Folios: 59

COLO: 19568-841-002-4

Sede Centro: Carrera 13 No. 27 - 00 Pisos 3,4,5 y 10 Bogotá, D.C.- Colombia

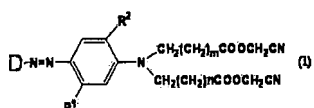
Web: www.sic.gov.co e-mai: info@sic.gov.co Conmutador: (571) 5870000 Fax: (571) 5870284 Línea: 018000-910165 Call Center: (571) 6513240

Julio 13 de 2012 - 13:45:36

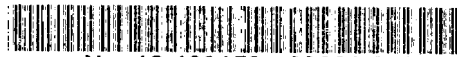
 Industria y Comercio SUPERINTENDENCIA		SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO DIVISION DE NUEVAS CREACIONES EXTRACTO PARA PUBLICACIÓN SOLICITUD FASE NACIONAL PCT	
(21) N° de solicitud: (22) Fecha de solicitud: (30) Prioridad (31) Prioridad (32) Fecha (33) País 2979/MUM/2009 2009/12/23 IN		(51) Int Cl: D06P 001/016 (71) Solicitante(s) COLOURTEX INDUSTRIES LIMITED (72) Inventor(es) PANKAJ DESAI Y OTROS (74) Apoderado: LUZ CLEMENCIA DE PAEZ	
(85) Fecha limite inicio fase nacional: 2012/07/23 (86) Datos relativos a la presentación de la solicitud PCT Fecha de presentación de la solicitud: 2010//12/23 No. de solicitud PCT/IN2010/000851		(87) Publicación internacional Fecha: 2011/06/30 N° publicación: WO 2011/077461 A4	
(54) Título: COLORANTES AZOICOS DISPERSOS			

Resumen:

Colorantes azoicos dispersos nuevos de fórmula (I), y procesos para la preparación de los mismos. Estos colorantes poseen una solidez al lavado, solidez a la sublimación y solidez a la luz superiores.



Industria y Comercio
SUPERINTENDENCIA



No. 12-123158- -00000-0000

Fecha: 2012-07-23 16:41:34 Dep. 2020 DIR.NUEVASCR
Tra. 11 PATENTEIYII Eve: 379 FASENACIONALI
Act. 411 PRESENTACION Folios: 59

PATENTE DE INVENCION ☐MODELO DE UTILIDAD ☐

Art 33 Decisión 486/00

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

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

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

DISEÑO INDUSTRIAL ☐

(Art. 119 Decisión 486/00)

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

ESQUEMA DE TRAZADO ☐

(Art. 92 Decisión 486/00)

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