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SUPERINTENDENCIA Y COMERCIO

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Trámite : 002 PATENTES D 1 REGISTRO/ 329 COMPLETOS

Dependencia: 2000 DIVISION DE NUEVAS CREACIONES

Señor

SUPERINTENDENTE DE INDUSTRIA Y COM

DIVISION DE NUEVAS CREACIONES

E. _____ S. _____ D. _____

Re: **P1.-OMYA S.A.S.-Expediente número 01-010.223.-**

1. Me refiero al memorial de sustitución de poder presentado a ese Despacho el 31 de Agosto de 2004.

2. Por medio del presente, atentamente me permito manifestar a ese Despacho, que hubo un **cambio** de Representante Legal para todos los asuntos de la Propiedad Industrial en Bogotá de **OMYA S.A.S.**, una sociedad organizada y existente de conformidad con las leyes de Francia, domiciliada en París Cedex, Francia.

3. En consecuencia, atentamente solicito a ese Despacho reconocerme personería, en este asunto, de conformidad con el documento de Representación Legal para todos los asuntos de la Propiedad Industrial en Bogotá de la sociedad **OMYA S.A.S.**, otorgado a favor de la **SUSCRITA (ALICIA LLOREDA)** y/o al doctor GUSTAVO TAMAYO y/o al doctor IGNACIO SANTAMARIA y/o ENRIQUE ALVAREZ de acuerdo con la copia debidamente autenticada ante Notario Público que adjunto al presente expediente (Artículos 26 y 39 de la Decisión 486 de la Comunidad Andina de Naciones).

4. Anexo al presente acompaño fotocopia, debidamente autenticada por Notario Público, de:

- (a) Documento que acredita a la SUSCRITA y/o al doctor GUSTAVO TAMAYO y/o al doctor IGNACIO SANTAMARIA y/o ENRIQUE ALVAREZ en los términos del párrafo 1º. del Artículo 543 del Decreto-Ley 410 de 1971, como

Representantes Legales en Bogotá para todos los asuntos relacionados con la propiedad Industrial de la sociedad **OMYA S.A.S.**, una sociedad organizada y existente de conformidad con las leyes de Francia, domiciliada en París Cedex, Francia.

- (b) Certificación Notarial expedida el 31 de Agosto de 2004; y
- (c) Traducción Oficial No. 286/04 correspondiente a las partes pertinentes del documento anterior, también debidamente legalizada hasta por el Ministerio de Relaciones Exteriores bajo el número 063382 de 8 de Septiembre de 2004

5. Ruego a usted tomar atenta nota de lo anterior y continuar con el trámite correspondiente.

Señor Superintendente,


ALICIA LLOREDA RICAURTE
T.P. 53.215

Los abajo firmados, OMYA S.A.S., una sociedad organizada y existente de conformidad con las leyes de Francia.

con domicilio en 35, Quai André Citroën,
75725 Paris Cedex 15
Francia.

nombramos por el presente a ALICIA LLOREDA y/o GUSTAVO TAMAYO y/o IGNACIO SANTAMARIA y/o ENRIQUE ALVAREZ, domiciliados en Bogotá, Colombia, con oficinas en dicha ciudad, Calle 72 No. 5-83, piso 6o., nuestros representantes legales y verdaderos en Bogotá, con facultades para recibir notificaciones y nombrar apoderados judiciales o extrajudiciales, con el fin de dar cumplimiento al parágrafo 1o. del artículo 543 del decreto 410 de 1971.

Los doctores ALICIA LLOREDA y/o GUSTAVO TAMAYO y/o IGNACIO SANTAMARIA y/o ENRIQUE ALVAREZ, o los apoderados que cualquiera de ellos designe, quedan especialmente facultados para representarnos ante las autoridades colombianas, administrativas, judiciales o de policía, en todos los trámites relativos a la propiedad industrial, a cuyo efecto les facultamos para dar ante dichas autoridades todos los pasos necesarios al objeto indicado; elevar solicitudes, declaraciones, reclamos, recursos y presentar desistimientos; formular descripciones, enmiendas, limitar el alcance de las solicitudes, presentar oposiciones y apelaciones; Instaurar cancelaciones, renunciar total o parcialmente a los registros, abonar todos los impuestos y cuotas y efectuar todo otro pago determinado por la ley; recibir todos los documentos y valores, dando el descargo respectivo; llenar cualesquiera otros requisitos y tomar, en fin, todas las medidas que creyeran conducentes al resguardo de nuestros intereses; y en caso de producirse oposición, pasando los antecedentes a los tribunales, quedan facultados para tomar intervención como demandantes o demandados ante los jueces que sean competentes, pudiendo transar, someter a árbitros, desistir, percibir y apelar, con todas las demás facultades que resulten necesarias, y por el presente declaramos desde ahora válido y bueno cuanto dichos representantes y/o los apoderados que cualquiera de ellos nombre hicieran en nuestro beneficio.

Asimismo, facultamos a los doctores ALICIA LLOREDA y/o GUSTAVO TAMAYO y/o IGNACIO SANTAMARIA y/o ENRIQUE ALVAREZ, para solicitar en la Oficina de Propiedad Industrial la protocolización de este documento y de cualquier poder que cualquiera de ellos otorgue a nombre nuestro.

Dado y firmado

The undersigned, OMYA S.A.S., a corporation organized and existing under the laws of France.

domiciled at 35, Quai André Citroën,
75725 Paris Cedex
France.

hereby appoint, ALICIA LLOREDA and/or GUSTAVO TAMAYO and/or IGNACIO SANTAMARIA and/or ENRIQUE ALVAREZ, of Bogotá, Colombia, with offices in said town, Calle 72 No. 5-83, 6th Floor, our true and legal representatives in Bogotá, with power to receive notifications and to appoint judicial or extrajudicial agents, so as to comply with paragraph 1o. of article 543 of decree 410 of 1971.

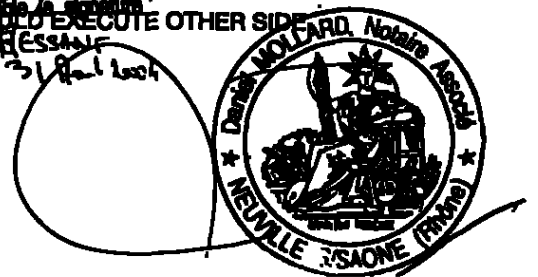
Doctors ALICIA LLOREDA and/or GUSTAVO TAMAYO and/or IGNACIO SANTAMARIA and/or ENRIQUE ALVAREZ, or the agents by any one of them appointed, are especially empowered to represent us before the administrative, judicial or police authorities of Colombia, in all proceedings pertaining to industrial property, for which purpose we authorize them to take before the said authorities all the necessary steps for the said end; to file petitions, declarations, claims, recourses and withdrawals, to draw up specifications; to file amendments, to limit the scope of applications, file oppositions; file cancellations total or partially waive registrations, to pay all installments and effect all other payments prescribed by law; to receive proper receipts, to comply with all other requirements and, in short, to take all those measures which they may deem fit for the protection of our interests; and in case of opposition, where the proceedings be passed over to the courts, we authorize said agents to act on our behalf, as complainants as well as defendants, before the competent judges, with full powers to make arrangements, to submit to arbitrators, to desist, to collect, to appeal, and, in short, with all such further powers as may be required, and we hereby declare from now on as valid and good all that said representatives and/or the agents by any one of them appointed may do for our benefit.

We also authorize doctors ALICIA LLOREDA and/or GUSTAVO TAMAYO and/or IGNACIO SANTAMARIA and/or ENRIQUE ALVAREZ, to apply for protocolization of this document and of any power of attorney by any one of them conferred in our name, before the Office of Industrial Property.

Given and signed this 31 August 2004

NOUS SOUSSIGNÉS,
Notaires associés à NEUVILLE-SAÛNE (France)
Certifions, en vertu de la loi, la signature
opposée ci-dessous à
A NEUVILLE-SAÛNE, le 31 août 2004

NOTARY SHOULD EXECUTE OTHER SIDE



CERTIFICADO NOTARIAL (SOCIEDAD)

Francia

{ss

París

Hoy 31 de Agosto de 2004, compareció
a quien conozco y
de quien me consta que firmó el anterior documento,
y quien debidamente juramentado declaró y dijo que
él es Jefe del Departamento de Patentes
de OMYA S.A.S., la compañía nombrada en el
documento que antecede, una sociedad
debidamente organizada y existente conforme a las
leyes de Francia, domiciliada en la ciudad de
París, legalmente constituida para un período de
duración que aún no ha terminado, que ejerce su
objeto social; conforme a las leyes de Francia, que
el declarante está autorizado por dicha Compañía
para conferir este poder; que el sello estampado por
él al pie de tal poder, en nombre y en representación
de la expresada Compañía, es el sello oficial de ella;
y que el objeto para el cual se confiere este
instrumento está comprendido dentro del de la
sociedad.

El suscrito Notario ha visto los Estatutos de
incorporación firmados en París, con fecha 22 Sep 2000
y certifica que de conformidad con
la legislación de dicho País, la anterior declaración
juramentada es prueba suficiente de que los hechos
sobre que ella versa son ciertos o verdaderos, de lo
cual da fe.

Notary Public (Notario Público).

NOTARIAL CERTIFICATE (CORPORATION)

France

{ss

Paris

On this 31 day of Aug, 2004,
personally
came
to me known, and known to me to be the person who
signed the foregoing instrument, who being by me
duly sworn did depose and say that he is the Head
of Patent Department of OMYA S.A.S., the
company named within, a Corporation organized and
existing under the laws of the France domiciled at the
City of Paris, legally constituted for a period of
tenure not yet expired, which exercises its corporate
purposes according to the laws of France, that the
deponent is authorized by said Company to confer
this power of attorney; that the seal affixed hereunto
by the deponent in the name and on behalf of said
Corporation is the corporate seal thereof; and that the
purpose for which this instrument is granted is
included within the corporate purposes of the
Company.

The undersigned Notary Public has seen the articles
of Incorporation of said Corporation executed at Paris,
FRANCE, under date of 22 September 2000 and
hereby certifies that under the laws of said County the
foregoing acknowledgment is sufficient proof that the
facts therein contained are true, which he attests.

NOTILLE

(Convention de La Haye du 5 octobre 1961)

Colombie

— République française

Le Notaire Public

— Daniel MOLLARD

— Notaire

— sceau de son étude

à Neuville Sisaone (Lyon)

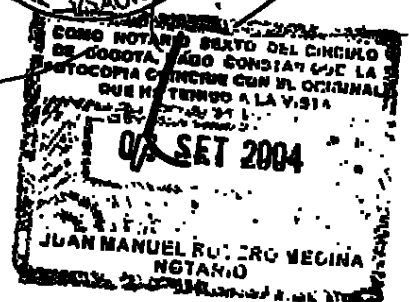
Attesté

5. — à Lyon 6. — le 16/9/04

7. — Par le Procureur général près la cour d'appel

8. — sous n° 5982 (page)

9. — Sceau 10. — Signature



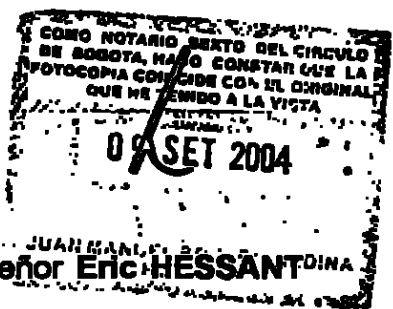
TRADUCCIÓN OFICIAL No.286/04 DE UN DOCUMENTO ESCRITO EN FRANCÉS, EL CUAL PARA SU IDENTIFICACIÓN SE SELLA CON EL SELLO DEL TRADUCTOR. ESTA ES UNA TRADUCCIÓN OFICIAL EFECTUADA EL DIA 06 DE SEPTIEMBRE DE 2004 POR JEAN-JACQUES TURPIN, C.E.: 193849 DE BOGOTÁ, TRADUCTOR E INTÉRPRETE OFICIAL SEGÚN RESOLUCIÓN No. 2680/91 DEL 19 DE DICIEMBRE DE 1991, EXPEDIDA POR EL MINISTERIO DE JUSTICIA DE COLOMBIA.

Autenticaciones que se hallan a continuación de un documento de poder conferido en inglés y español por OMYA S.A.S., domiciliada en 35, Quai André Citroën, 75725 Paris Cedex, Francia y otorgado a los Doctores ALICIA LLOREDA y/o GUSTAVO TAMAYO y/o IGNACIO SANTAMARIA y/o ENRIQUE ÁLVAREZ, todos domiciliados en Bogotá, Calle 72 No. 5 – 83, 6º piso.

Dado el 31 de Agosto de 2004. Firma ilegible.

Legalización de la firma del Señor Eric Hessant por Daniel Mollard Notarios asociados en NEUVILLE-SUR-SAÔNE (Rhône). Dado en NEUVILLE-SUR-SAÔNE, el 31 de Agosto de 2004. Firma ilegible del Notario.

Sello: Daniel MOLLARD, Notario Asociado en NEUVILLE-SUR-SAÔNE (Rhône) – República Francesa.



CERTIFICADO NOTARIAL (SOCIEDAD)

Legalización por parte del suscrito Notario de la firma del Señor Eric HESSANT quien desempeña el cargo de Jefe del Departamento de Patentes de la compañía OMYA S.A.S., una sociedad legalmente constituida y existente de acuerdo con las leyes de Francia, domiciliada en Paris. Además, dicho Notario certifica que el signatario, según las leyes de Francia, tiene facultad para otorgar el presente documento. Los hechos anteriores le constan por haber examinado los

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estatutos de la compañía, firmados en París el 22 de Septiembre de 2004, y de todo ello da fe.

Dado en París, el 31 de Agosto de 2004. Firma ilegible del Notario.

Sello: Daniel MOLLARD, Notario Asociado en NEUVILLE-SUR-SAÔNE (Rhône) – República Francesa.

APOSTILLA
(Convención de La Haya del 5 de octubre de 1961)
Colombia

1. - República Francesa

El presente documento público

2. - ha sido firmado por el Señor MOLLARD Daniel

3. - obrando en calidad de Notario

4. - con sello de su Notaria en Neuville-sur-Saône (Rhône)

CERTIFICADO

5. - En Lyon

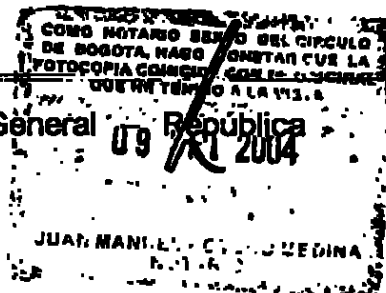
6. - El 01 de septiembre de 2004

7. - Por el Procurador General ante el Tribunal Superior

8. - Bajo el número 6982 (2 páginas)

9. - Sello: Tribunal Superior de Lyon - Procurador General de la República Francesa.

10. - Firma ilegible.



Es traducción fiel y completa de la cual se deja copia en los archivos de esta oficina para confrontación y a la cual me remito.

Traducción oficial No. 286/04.

Traductor: Jean-Jacques Turpin.

Bogotá, D.C., 06 de septiembre de 2004.

Traducción Oficial No. 286/04
JEAN - JACQUES H. TURPIN
Traductor e Intérprete Oficial
FRANCÉS - ESPAÑOL
Ces. Minjusticia No. 2680/91

MINISTERIO DE RELACIONES
EXTERIORES

En respuesta

663382

COTA FIRMADA EN EL
DOCUMENTO DESEMPLEA
LAS FUNCIONES INDICADAS

NO SE ASUME
RESPONSABILIDAD DEL TEXTO

2004 SEP -8 P 1:51

Lee
JEFE DE LEGALIZACIONES
SANTAFE DE BOGOTA D.C.

COMO NOTARIO PARA DEL CIRCUITO
DE BOGOTA, HAGO CONSTAR QUE LA
FOTOCOPIA CONCIBE CON EL ORIGINAL
QUE HE TENIDO A LA VISTA
09 SET 2004

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**SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO
DIVISION DE NUEVAS CREACIONES**

2020
Bogotá, D.C., 20 de junio de 2006

Doctora
ALICIA LLOREDA RICAURTE
Apoderada

Oficio No. **06921**

ASUNTO	Radicación	01-10223
	Trámite	002
	Evento	001
	Actuación	430
	Folios	020

Como resultado del examen de fondo, realizado con fundamento en el artículo 45 de la Decisión 486 de la Comisión de la Comunidad Andina, se le comunica:

1. Documentos estudiados

- Para el presente estudio se tuvo en cuenta el capítulo descriptivo que se encuentra en los folios 8 a 51 y el capítulo reivindicatorio que se encuentra en los folios 52 a 55 que comprende diecisiete (17) reivindicaciones.
- De acuerdo con el folio 125 de la solicitud en estudio, se considerará la prioridad reivindicada sobre la solicitud de Francia No. 0001788 del 14 de febrero de 2000.

2. Objeto de la Invención

- La invención propuesta se relaciona con la utilización de polipropilenos isotácticos de muy elevada fluidez para la preparación de concentrados de cargas utilizables en los termoplásticos de tipo olefínico, tales como el polipropileno, el polietileno y por regla general: los polímeros utilizados solos o en mezcla, a base de monómeros etilénicos conteniendo entre 2 y 6 átomos de carbono polimerizado solos o en mezcla.

En la reivindicación independiente 1 se define un procedimiento para la preparación de mezclas – maestras o concentrados de carga(s) mineral(es) fuertemente cargados en materia(s) o carga(s) mineral(es), utilizables para cargar materias termoplásticas mediante dichas cargas minerales, poniendo en aplicación polímeros o mezclas de polímeros como ligante, caracterizado en que dichos polímeros o mezclas de polímeros:

- Comprenden por lo menos un polipropileno isotáctico de muy elevada fluidez, y
- Tienen un porcentaje de cristalinidad comúnmente denominado Índice de isotacticidad superior a un 20% aproximadamente, preferentemente comprendido entre un 30% y un 90%, muy preferentemente comprendido entre un 50% y un 85%, medido por el método DSC.

En la reivindicación independiente 10 se define una mezcla – maestra o concentrado de carga(s) mineral(es) fuertemente cargadas en materia(s) cargas(s) mineral(es), **caracterizada en que** contiene una cantidad de carga mineral superior a un 80% en peso, preferentemente de un 80,5% a un 95,0% y muy preferentemente de un 82,0% a un 93,0%, en que posee un índice de fluidez o MFI superior o igual a 5g/10 min. (190°C – 5 kg – 2,09 mm) medido según la norma NF T 51-620, de preferencia superior o igual a 8 g/10 min (190°C – 5 kg – 2,09 mm), y en que contiene por lo menos un polímero de tipo polipropileno isotáctico de muy elevada fluidez que presenta un porcentaje de cristalinidad (denominado igualmente índice de isotacticidad) superior a un 20% aproximadamente, preferentemente comprendido entre un 30% y un 90%, muy preferentemente comprendido entre un 50% y un 85%, medido por el método DSC.

En la reivindicación independiente 13 se define un procedimiento para preparar materias termoplásticas cargadas mediante carga(s) mineral(es), **caracterizado en que** se efectúa una mezcla, en una o varias veces, de dicha o dichas materias termoplásticas con una mezcla maestra según cualquiera de las reivindicaciones de 10 a 12, **caracterizado en que** dicha o dichas materias termoplásticas son elegidas entre los polietilenos baja densidad, lineales o ramificados, o los polietilenos de alta densidad, los polipropilenos homo o copolímeros, los poli-isobutilenos y los copolímeros obtenidos durante la polimerización de dos al menos de los comonómeros etileno, propileno, isobutileno, las poliolefinas modificadas mediante injerto, tales como las poliolefinas halogenadas, los polipropilenos modificados EPDM (etileno, propileno, dieno, monómero), los polipropilenos modificados SEBS (estireno, etileno, butileno, estireno) o aún de dos al menos de polímeros y copolímeros citados anteriormente, en mezcla, o aún los cauchos o elastómeros naturales o sintéticos y termoplásticos, entre estos últimos principalmente los cauchos SBR (caucho estireno – butadieno) o EPDM o SEBS termoplásticos.

En la reivindicación 14 se define la utilización de mezclas – maestras según cualquiera de las reivindicaciones 10 a 12, eventualmente en forma de agregados o de granulados, para fabricar artículos industriales moldeados, mediante termoformado o inyección.

En la reivindicación 15 se define la utilización de mezclas – maestras según cualquiera de las reivindicaciones 10 a 12, eventualmente en forma de agregados o de granulados para la extrusión y principalmente de una película, de una vaina, o de un tubo, o de un perfilado o de hilos y de cables, para la extrusión soplado, la extrusión de cintillas o de hojas o aún la extrusión satinado en papel o hoja metálica.

En la reivindicación 16 se define la utilización de mezclas – maestras según cualquiera de las reivindicaciones 10 a 12, eventualmente en forma de agregados o granulados, para el calandrado.

En la reivindicación 17 se definen objetos moldeados, extrusionados o calandrados obtenidos mediante la puesta en aplicación de mezclas – maestras según cualquiera de las reivindicaciones 10 a 12.

- Se afirma que el problema técnico que se plantea es doble: se trataba de seleccionar polímeros que pudiesen transportar a concentraciones muy elevadas cargas en las mezclas maestras, las cuales se esparcirían de nuevo en las diferentes matrices poliméricas utilizadas en la industria del plástico sin deteriorar las propiedades mecánicas de los productos industriales obtenidos al final tras la nueva disolución, incluso aumentándolos.

Además, se menciona que en el arte anterior se comercializaban productos amorfos que se obtienen más fácilmente recurriendo a co- o terpolímeros, los cuales plantean entonces, como algunos productos anteriores de muy baja cristalinidad, problemas de compatibilidad con las poliolefinas. Esas resinas son más fluidas al estado fundido y sus granulados o aglomerados se pegan en el estado de presentación en frío y perturban así pues considerablemente su manipulación y dosificación.

- El objeto de la invención definido se catalogó como C08J 3/22, según la Clasificación Internacional de Patentes (IPC).

3. Claridad de la solicitud

El artículo 28 de la Decisión 486 de la Comisión de la Comunidad Andina establece "La descripción deberá divulgar la invención de manera suficientemente clara y completa para su comprensión y para que una persona capacitada en la materia técnica correspondiente pueda ejecutarla".

- El título de la invención se refiere a la 'utilización de polipropilenos isotácticos de elevada fluidez para la preparación de concentrados de cargas utilizables en los termoplásticos de tipo olefínico, concentrados de cargas y termoplásticos obtenidos de este modo'. Sin embargo, no es posible definir la invención de tal manera dado que los usos no son patentables en Colombia, únicamente los productos y los procedimientos son patentables. Así las cosas, se recomienda que el título sea modificado de modo que sea acorde con las posibilidades de protección en Colombia y con el objeto a reclamar según el capítulo reivindicatorio incluido.
- El capítulo descriptivo contiene intervalos acompañados por la expresión "aproximadamente" la cual genera ambigüedad pues no es posible determinar objetivamente cuán aproximado o no puede estar un número respecto a los límites del intervalo numérico. Por lo tanto, se recomienda eliminar dicha expresión.
- En conclusión, el capítulo descriptivo no cumpliría con el requisito de claridad de acuerdo con el artículo 28 de la Decisión 486.

El artículo 30 de la Decisión 486 de la Comisión de la Comunidad Andina establece que: "Las reivindicaciones definirán la materia que se desea proteger mediante la patente. Deben ser claras y concisas y estar enteramente sustentadas por la descripción.

Las reivindicaciones podrán ser independientes o dependientes. Una reivindicación será independiente cuando defina la materia que se desea proteger sin referencia a otra reivindicación anterior. Una reivindicación será dependiente cuando defina la materia que se desea proteger refiriéndose a una reivindicación anterior. Una reivindicación que se refiera a dos o más reivindicaciones anteriores se considerará una reivindicación dependiente múltiple".

- En el preámbulo de la reivindicación independiente 1 se menciona un 'Procedimiento para la preparación de mezclas-maestras o concentrados de carga(s) mineral(es) fuertemente cargados en materia(s) o carga(s) mineral(es), utilizables para cargar materias termoplásticas mediante dichas cargas minerales, **poniend en aplicación polímeros mezclas de polímeros com ligante**' (Negrita Personal). Así, el planteamiento parece tener problemas de redacción a causa de la traducción realizada al español. Se recomienda revisar y corregir de forma que se comprenda más fácilmente.

- En la reivindicación independiente 1 se plantea un 'procedimiento para la preparación de mezclas-maestras o concentrados de carga(s) mineral(es) fuertemente cargados en materia(s) o carga(s) mineral(es)'. No obstante, en la parte caracterizante no se hace mención de una secuencia de etapas, operaciones unitarias, condiciones de operación, etc., que permita definir el procedimiento como normalmente se conoce en ingeniería. Por el contrario, define un procedimiento a partir de características inherentes a las mezclas-maestras como producto, lo cual no es coherente. Dado lo anterior, se recomienda modificar la parte caracterizante de la reivindicación independiente de manera que se puedan identificar claramente la secuencia de etapas, etapas de transformación de materia y/o energía, y condiciones de operación de conformidad con lo revelado en la descripción de la solicitud.
- En la reivindicación independiente 1 se menciona 'un procedimiento para la preparación de mezclas-maestras o concentrados de carga(s) mineral(es) fuertemente cargados en materia(s) [...] 'polipropileno isotáctico de muy elevada fluidez' (Negrita Personal).

Al incluirse los términos relativos señalados con negrita no es posible identificar cuán fuertemente cargada es la mezcla-maestra y tampoco es posible identificar objetivamente la fluidez del polipropileno isotáctico por lo cual se generan dudas al lector potencial sobre el alcance exacto de la característica. Dado lo anterior, se recomienda reemplazar dichas expresiones relativas por los valores numéricos, por ejemplo, con los porcentajes de carga e índices que permiten comprender la fluidez para el polipropileno isotáctico (por ejemplo la información específica de la reivindicación 2).

- En la reivindicación independiente 10 también se incluye la expresión 'fuertemente cargados'. Se recomienda modificar según las observaciones del punto anterior.
- En las reivindicaciones independientes 1 y 10 se incluye la expresión "aproximadamente" para referirse al intervalo numérico del índice de isotacticidad, no obstante, esta expresión no permite definir exactamente el intervalo pues no se puede deducir con objetividad cuán aproximado puede ser un número de índice respecto a los límites del intervalo. Por lo tanto, se recomienda eliminar la expresión "aproximadamente" de forma que los límites del intervalo sean puntuales.
- En la reivindicación dependiente 4 se hace especificación sobre la composición de la mezcla de polímeros que forman el ligante. Allí se expresan tres grupos de componentes principales. Del primero se menciona que presenta de 30% a un 100% de polipropileno isotáctico..., el segundo se menciona que presenta de un 0 a un 70% de poliolefinas amorfas..., y el tercer grupo presenta de un 0 a un 5% de aditivos...

Al incluir intervalos numéricos cuyo límite inferior sea cero (0), se estaría dando a entender que la mezcla de polímeros que forman el ligante pueden o no tener compuestos de poliolefinas amorfas y pueden o no tener compuestos de aditivos. Dado lo anterior, se recomienda revisar si la idea a transmitir es esa que se entiende a simple vista o corregir de conformidad con lo sustentado en la descripción.

- En la reivindicación independiente 13 se define un procedimiento empleando dos expresiones "caracterizado por" de forma que no es posible identificar con seguridad donde empieza la parte caracterizante que contiene los detalles técnicos novedosos.

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Se recomienda modificar la construcción de la reivindicación de forma que aparezca solamente una expresión "caracterizado por" para que sea fácil identificar dónde termina el preámbulo y donde comienza la parte caracterizante.

- En la reivindicación independiente 13 se define un procedimiento mediante características de los componentes del producto lo cual no es coherente. Se espera que un procedimiento, tal como los conocidos en ingeniería, presenten información de la secuencia de etapas de proceso, características de las etapas, condiciones de operación, etc., por lo cual se recomienda realizar una revisión y corrección de la parte caracterizante de forma que cumpla con tales requisitos.
- En conclusión, el capítulo reivindicatorio no cumpliría con el requisito de claridad de acuerdo con el artículo 30 de la Decisión 486. Por lo tanto, se recomienda realizar las modificaciones pertinentes según las observaciones incluidas y allegar un nuevo capítulo reivindicatorio con tales modificaciones.

4. Reivindicaciones de uso

El artículo 14 de la Decisión 486 de la Comisión de la Comunidad Andina establece: "Los Países Miembros otorgarán patentes para las invenciones, sean de producto o procedimiento, en todos los campos de la tecnología, siempre que sean nuevas, tengan nivel inventivo y sean susceptibles de aplicación industrial."

- Las reivindicaciones 14 a 17 constituyen la utilización y aplicación de las mezclas maestras pues se menciona que pueden emplearse en forma de agregados o de granulados, para fabricar artículos industriales moldeados mediante termoformado o inyección, para extrusión de una película, valna, tubo, perfilado, hilos, cables, extrusión soplado, extrusión de cintillas o de hojas, extrusión satinado en papel o hoja metálica, uso en forma de agregados o granulados para calandrado, elaboración de objetos moldeados, extrusionados o calandrados.

Dado que la legislación contempla únicamente la posibilidad de protección de productos y/o procedimientos, los usos no pueden ser patentables.

- En conclusión, las reivindicaciones 14 a 17 no serían patentables de acuerdo con el artículo 14 de la Decisión 486.

5. Determinación del estado de la técnica

El artículo 16 de la Decisión 486 de la Comisión establece: "El estado de la técnica comprenderá todo lo que haya sido accesible al público por una descripción escrita u oral, utilización, comercialización o cualquier otro medio antes de la fecha de presentación de la solicitud de patente o, en su caso, de la prioridad reconocida.

Sólo para el efecto de la determinación de la novedad, también se considerará dentro del estado de la técnica, el contenido de una solicitud de patente en trámite ante la oficina nacional competente, cuya fecha de presentación o de prioridad fuese anterior a la fecha de presentación o de prioridad de la solicitud de patente que se estuviese examinando, siempre que dicho contenido esté incluido en la solicitud de fecha anterior cuando ella se publique o hubiese transcurrido el plazo previsto en el artículo 40."

- A pesar de los defectos de claridad detallados en el numeral 3 de la presente comunicación, se consultaron las bases de datos con que cuenta y tiene acceso la entidad y se consideró el 14 de febrero de 2000 como fecha para investigar el estado de la técnica.
- De acuerdo con lo establecido en el artículo 18 se determinó el estado de la técnica y se encontraron los siguientes antecedentes:

No.	Documento No.	Título	Fecha de Publicación
1	US3767444	"PIGMENT COMPOSITION FOR COLORING POLYPROPYLENE"	23 de octubre de 1973
2	GB1541091	"MASTERBATCHES FOR COLOURING POLYMERS AND COPOLYMERS"	21 de febrero de 1979
3	JP10001572	"COLORANT COMPOSITION FOR POLYPROPYLENE"	6 de enero de 1998

6. Evaluación de los requisitos de patentabilidad

El artículo 14 de la Decisión 486 de la Comisión de la Comunidad Andina establece: "Los Países Miembros otorgarán patentes para las invenciones, sean de producto o de procedimiento, en todos los campos de la tecnología, siempre que sean nuevas, tengan nivel inventivo y sean susceptibles de aplicación industrial."

En cumplimiento con este artículo, se procedió a evaluar los requisitos de novedad, nivel inventivo y aplicación industrial con el fin de establecer la patentabilidad de la invención reivindicada en la solicitud en estudio.

Evaluación del Nivel Inventivo:

El artículo 18 de la Decisión 486 de la Comisión de la Comunidad Andina establece: "Se considerará que una invención tiene nivel inventivo, si para una persona del oficio normalmente versada en la materia técnica correspondiente, esa invención no hubiese resultado obvia ni se hubiese derivado de manera evidente del estado de la técnica."

Respecto al estado de la técnica:

- En el documento **US3767444** (llamado D1 de aquí en adelante) se divulgan composiciones de pigmentos para coloreado de polipropileno. El polipropileno es coloreado fácilmente y de forma homogénea por adicionar a un polímero fundido una composición que consiste de cera de polipropileno como portador, un pigmento dispersado en el portador, y un agente dispersante no iónico en una cantidad suficiente para dispersar el pigmento en la cera a una temperatura por encima del punto de fusión del último.

En D1 se sugiere que si polipropileno isotáctico es para colorear por una concentración de pigmento relativamente pesada, y bajo condiciones de operación de rápida dispersión, es preferible adicionar polipropileno isotáctico a la composición de pigmento durante su preparación de modo que la porción portadora de la composición puede consistir de una mezcla de cera de polipropileno y polipropileno isotáctico en la cual este último puede estar en una cantidad de 80% en peso.

- En el documento **GB1541091** (llamado D2 de aquí en adelante) se divulgan mezclas maestras para coloreado de polímeros y copolímeros. En esta invención, la mezcla maestra comprende no más de 25% en peso de un polipropileno atáctico, por lo menos un polímero seleccionado de polietileno de baja densidad, alta densidad, polipropileno isotáctico y copolímeros de etilen/vinil acetato y por lo menos un pigmento y/o agente modificador.

En D2 se comenta que es conocido preparar mezclas maestras por mezclar rellenos y pigmentos en un total de alrededor de 75% por peso, con polietileno de baja densidad, polietileno de alta densidad, copolímeros de etilen/vinil acetato o polipropileno isotáctico.

En los ejemplos 6 a 9 de D2 se observan diversas composiciones de la invención revelada. En ellos se puede observar que se incluye polipropileno isotáctico además del polipropileno atáctico en las mezclas maestras.

- En el documento **JP10001572** (llamado D3 de aquí en adelante) se divulgan composiciones concentradas de pigmentos minerales en una resina portadora que comprende una mezcla de un polipropileno isotáctico y un polipropileno sindiotáctico en proporciones de 19:1 a 1:1. El índice de fluidez (MFR) del polipropileno isotáctico pudiendo variar de 350 g/10 min hasta 820 g/10 min medido a 230°C, 2.16 kg. Es deseable que la resina portadora contenga un modificador como componente auxiliar de modo que el desempeño pueda ser mejorado. El modificador preferiblemente comprende una poliolefina (como polietileno) o sus derivados.

Respecto a la solicitud en estudio:

- El técnico de nivel medio versado en la materia encargado de resolver el problema puede ser un ingeniero químico que tenga conocimientos en polímeros y que atiende a planes de mejoramiento normalmente formulados en las empresas.
- De acuerdo con las reivindicaciones independientes de la solicitud en estudio, se entiende que el principio técnico sobre el cual se fundamenta la propuesta consiste en que los polímeros añadidos como ligantes a los concentrados de carga mineral o mezclas maestras comprendan por lo menos un polímero isotáctico de muy elevada fluidez y alta cristalinidad. Sin embargo, como se puede comprobar arriba en los comentarios del estado de la técnica, con las enseñanzas de D1, D2 o D3 se puede observar que el principio fundamental puede derivarse del estado de la técnica y que un técnico de nivel medio versado en la materia que tenga acceso a cualquiera de estos documentos puede motivarse a desarrollar cargas maestras que posean al menos un polipropileno isotáctico de elevada fluidez.

Al citar tres documentos independientes entre los que se hallan unos con publicaciones de fechas antiguas y otro con fecha reciente pero aún en el estado del arte, se puede observar con interés que la adición de por lo menos un polipropileno isotáctico a las mezclas maestras es algo que viene conociéndose desde varias décadas y que sigue siendo una constante. Por lo tanto, es una enseñanza que forma parte de los conocimientos básicos que posee un técnico y que tendría en cuenta en el momento de realizar un mejoramiento que esté dentro de la línea normal de avance de la tecnología.

En D2 se presenta información adicional sobre las proporciones porcentuales en peso de las mezclas maestras y de las composiciones de pigmentos. En los ejemplos contenidos en dicho documento se puede observar que las proporciones en peso son equivalentes a los de la solicitud en estudio y que puede incluirse otro polímero olefínico como también se requiere en la propuesta estudiada.

En D3 se divulga información sobre la incorporación de polipropilenos isotácticos de un Índice de fluidez muy elevado equivalente al de la solicitud.

- Teniendo en cuenta lo anterior, un técnico de nivel medio versado en la materia con conocimientos básicos en polímeros conocería las diversas alternativas de polipropilenos isotácticos existentes según sus propiedades particulares y con base en cualquiera de las propuestas D1, D2 o D3, podría motivarse a incluir polipropilenos isotácticos en aplicaciones tales como mezclas maestras de elevada carga mineral, de tal manera que seleccionaría polipropilenos isotácticos a partir de realizar diseño de experimentos tales que arrojarían resultados para escoger polímeros equivalentes a los de la solicitud, con características tales que permitan mejores propiedades físicas en las mezclas maestras como lo es un elevado grado de fluidez.
- Por lo anteriormente expuesto, las invenciones definidas por las reivindicaciones 1 a 13 de la solicitud, podrían verse afectadas en su nivel inventivo ya que se derivan de manera evidente del estado de la técnica y pueden ser obvias para un técnico de nivel medio versado en la materia. Por tanto, no cumplirían con las disposiciones del artículo 18 de la Decisión 486 de la Comisión de la Comunidad Andina.
- En conclusión, los requisitos de patentabilidad de la presente solicitud se encontrarían afectados así:

No.	Documento	Reivindicaciones Afectadas	Requisito que afecta
1.	US3767444	1 – 13	Nivel Inventivo
2.	GB1541091	1 – 13	Nivel Inventivo
3.	JP10001572	1 – 13	Nivel Inventivo

Se anexan los apartes principales de las anterioridades en el documento adjunto.

En cumplimiento del artículo 45 de la Decisión 486 de la Comisión de la Comunidad Andina, se le indica que debe dar respuesta dentro del término de sesenta días contados a partir de la fecha de notificación de la presente comunicación. En caso de no dar respuesta al presente requerimiento, o si a pesar de la respuesta subsistieran los impedimentos para la concesión, se denegará la patente.

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 No. 10 de 2001.

ALIX CARMENZA CESPEDES DE VERGEL
Jefe de División de Nuevas Creaciones

El anterior requerimiento fue notificado por fijación en lista, de fecha 29 JAN. 2006

CONCEPTO TECNICO No. 970	EXAMINADOR TECNICO Código No. 202042
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United States Patent [19]
Zelberger

[11] 3,767,444
[45] Oct. 23, 1973

[54] **PIGMENT COMPOSITION FOR COLORING
POLYPROPYLENE**

1,013,104 5/1962 Great Britain 260/41 C

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Primary Examiner—Dalbert E. Gents
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[22] **Filed:** Dec. 1, 1971

[21] **Appl. No.:** 263,887

[52] **U.S. Cl.:** 106/308 B, 106/272, 106/308 M,
106/308 Q, 260/28.5, 260/41 B, 260/41 C

[51] **Int. Cl.:** C08f 45/04, C08f 45/14

[58] **Field of Search:** 106/308 M, 308 Q,
106/272; 260/41 C, 28.5 A, 41 B

[56] **References Cited**

UNITED STATES PATENTS

3,586,247 6/1971 Perrine 106/308 M

FOREIGN PATENTS OR APPLICATIONS

1,265,702 4/1968 Germany 260/41 C

[57] **ABSTRACT**

Polypropylene is colored readily and homogeneously by adding to the molten polymer a pigment composition consisting of polypropylene wax as a carrier, a pigment dispersed in the carrier, and a non-ionic dispersing agent in an amount sufficient to disperse the pigment in the wax at a temperature above the melting point of the latter. Many pigments and dispersing agents stable at the melting temperature of polypropylene for a period sufficient to permit dispersing the pigment in the molten polymer are commercially available.

12 Claims, No Drawings

FIGMENT COMPOSITION FOR COLORING POLYPROPYLENE

This invention relates to the coloring of polypropylene, and particularly to a pigment composition suitable for this purpose.

Polypropylene is colored almost exclusively by means of pigments mixed with the polymer in bulk prior to shaping. When the conventionally pigmented polymer melt is extruded in the manufacture of fibers or similar continuous shapes of relatively small cross section, the pigments cause clogging of the extrusion nozzles and a costly interruption of operations frequent enough to increase the production cost by a significant amount. Non-uniform dispersion of the pigment in the polymer also can cause local weakening of the fibrous material and breaks during further processing. The color strength and transparency or translucency of polypropylene fibers containing inadequately dispersed pigments is impaired.

It is common practice to incorporate the pigments in the molten polymer in the form of pigment compositions essentially consisting of a carrier and of the pigment dispersed in the carrier. The pigments employed must be stable at the temperature of the molten polymer for a reasonable period, and there is a wide choice of organic and inorganic pigments meeting this requirement. However, the materials available heretofore as carriers for the pigments are few and not entirely satisfactory as previously employed.

Polypropylene itself has been proposed as a carrier for pigment compositions of high pigment content. However, pigment compositions containing polypropylene as a carrier are extremely viscous and can be prepared only on very heavy mixers or kneaders which are expensive to build and to operate. The amount of pigment which can be incorporated in polypropylene even on heavy kneaders presently available is limited because the viscosity of the composition increases sharply with increasing pigment content.

Amorphous polypropylene has also been recommended heretofore as a carrier material in pigment compositions, but was found unsatisfactory because of difficulties in dispersing pigments in this carrier, and because of the tackiness of the pigment compositions so prepared which is due to atactic material in amorphous polypropylene.

The term "atactic" as employed herein designates macromolecules having randomly arranged side chains as compared to the uniform arrangement of the side chains in the macromolecules of isotactic polypropylene.

It is another disadvantage of pigment preparations containing amorphous polypropylene as a carrier that the coloring effects produced are greatly affected by the temperature at which the compositions are incorporated in the bulk of the polypropylene. Adding a copolymer of ethylene and propylene to the amorphous polypropylene carrier has not produced adequate improvement.

It has further been proposed to employ polypropylene waxes as pigment carriers. Such waxes are prepared by heating isotactic polypropylene beyond its melting point to a relatively high temperature and/or for relatively long periods as will be described hereinbelow in more detail. The waxes are compatible with isotactic polypropylene which is the predominant polypropylene type in the manufacture of fibers and other

shapes. It has been common practice to grind the polypropylene wax together with the pigment in aqueous suspension in a mill equipped with solid grinding bodies such as balls or pebbles. The ground material is separated from much of the water on a suction filter, washed with fresh water on the filter, and then dried.

The heterogeneous pigment compositions so produced are superior to the earlier compositions described above, but adequately uniform dispersion of the pigment in the ultimate polypropylene mass still could not be achieved. Moreover, the manufacture of pigment compositions by wet grinding requires enough time and labor to be quite costly. Surfactants added to the aqueous suspension for the grinding step proper are removed during washing and are not available for dispersing the pigment in the polypropylene.

The primary object of the invention is the provision of a pigment composition which disperses uniformly in molten isotactic polypropylene and is free from the shortcomings of known composition referred to above so as to produce colors of high intensity without interfering with the operation of extrusion equipment and without impairing the quality of fibers or other extrudates.

It has been found that pigments can be dispersed uniformly in propylene wax in the absence of water and in the presence of a nonionic dispersing agent at the melting temperature of the polypropylene wax on a kneader which exerts shearing stresses on the processed material.

It is preferred first to melt the propylene wax on the kneader at about 160° to 180°C, thereafter to work the dispersing agent into the molten wax, and last to incorporate the dry pigment in the melt while maintaining a temperature of about 170°C.

If isotactic polypropylene is to be colored by a relatively heavy concentration of pigment, and under operating conditions which require particularly rapid dispersion of the pigment composition in the molten polypropylene, it is preferred to add isotactic polypropylene to the pigment composition during its preparation so that the carrier portion of the composition may consist of a mixture of polypropylene wax and isotactic polypropylene in which the isotactic polypropylene may amount to as much as 80 percent by weight, there being no lower limit to the amount of this material that may usefully be employed.

The isotactic polypropylene is readily combined with the polypropylene wax by first melting the wax on the kneader and thereafter working the isotactic polypropylene into the molten wax. The use of very heavy equipment, such as a Banbury mixer, is not required for this mixing step nor for the subsequent addition of the pigment and dispersing agent if the isotactic polypropylene does not exceed 80 percent of the combined weight of isotactic polypropylene and polypropylene wax.

Best results are obtained by the use of dispersing agents having an HLB value (hydrophile-lipophile balance) [W.C. Griffin, J. Soc. Cosmetic Chemists 1 (1949) 311; 5 (1954) 249] lower than ten, that is, in the range of strong lipophile attraction. Esters of polyhydric alcohols with aliphatic, monocarboxylic acids having 10 to 18 carbon atoms are representative of the many suitable dispersing agents which are staple articles of commerce, and are preferred.

The dispersing agents are most effective in amounts of 1 to 5 percent of the weight of the pigment composition. Higher concentrations of dispersing agents up to 10 or 15 percent do not unfavorably affect the properties and operating characteristics of the pigment preparations, but do not produce further improvement and are thus uneconomical.

The amount of pigment must be selected according to the desired effect and to the nature of the pigment. It is not usually practical to use less than 10 percent. A certain amount of experimentation is unavoidable for working with a pigment on which information is not available from earlier runs under specific conditions. The compositions of the invention generally are capable of containing a higher percentage of inorganic pigments than of organic pigments, the upper limit for inorganic pigments usually varying between 60 and 80 percent, that for organic pigments between 35 and 40 percent, all percentage values herein being by weight unless specifically stated otherwise. Enough pigment should be added to the carrier and dispersing agent to give desirable kneading characteristics to the mixture at the melting point of the carrier. Typical pigment compositions of the invention may contain 30 to 40 percent copper phthalocyanine pigments or 70 to 80 percent cadmium red.

Nonionic surfactants having an HLB value lower than ten are generally effective, but the esters of glycerol and other polyhydric alcohols with higher aliphatic monocarboxylic acids are preferred because of their low cost, the mono- and diesters of such alcohols with stearic, palmitic, and oleic acid being least expensive. Nonionic surfactants which are obtained by condensation of ethylene oxide with alkanols, alkylphenols and carboxylic acids are commonly available in commercial quantities and are equally effective but more costly.

The pigment compositions of the invention disperse readily in isotactic polypropylene and produce brilliant coloring effects. They are equally applicable to the coloring of types of polypropylene other than isotactic polypropylene, but are not as unique in the case of application to amorphous polypropylene as they are in the coloring of isotactic polypropylene.

The following Examples are further illustrative of the invention.

EXAMPLE 1

Isotactic polypropylene polymer which was 94.4 percent insoluble in heptane and had a melting point of about 165°C as determined on a Kofler melting point apparatus was held for 30 minutes at 330°C. The mass had a relatively low viscosity and was permitted to cool under stirring. A wax-like granulate was obtained and could be pulverized in a hammer mill when cooled with dry ice. After screening for removal of particles larger than 0.5 mm, there was obtained a slightly brownish powder of polypropylene wax melting at about 138°C.

When the procedure described above was repeated, but the polymer was heated in a nitrogen atmosphere rather than in the open air, the polypropylene wax powder produced had a melting point of 149°C. A product melting at 141°C was obtained when the heating period under a nitrogen blanket was extended to 90 minutes, but the temperature reduced to 300°C. Melting at 350°C for 30 minutes yielded a wax melting at about 128°C, and a wax melting at about 112°C was formed by heating for 20 minutes at 400°C.

Polypropylene waxes may thus be prepared to any desired melting point in an approximate range of 110° to 150°C by varying the heating time and temperature of the isotactic polypropylene employed as a starting material.

EXAMPLE 2

A kneader mixer having a four-liter trough equipped with Z-type blades and a heating jacket was charged with 877.8 g polypropylene wax produced by heating isotactic polypropylene for four hours at 320°C. The wax was kneaded and simultaneously heated to 170°C. 46.2 g Commercial dispersing agent consisting of a mixture of glycerol mono- and diesters and having an HLB value of 3.2 was homogeneously worked into the melt. Thereafter 396 g copper phthalocyanine powder (β modification) was added.

The viscous mass so obtained was still capable of being kneaded without difficulty on the small apparatus, and kneading was continued for one hour at 170°C after the pigment had been added. Upon cooling, there was obtained a brittle, non-tacky mass which was ground to a free-flowing powder by the kneader blades.

The pigment composition contained 30 percent coloring matter, dispersed readily and uniformly in molten isotactic polypropylene and produced a bright, strong color.

About the same results were obtained when sorbitan monooleate was employed as a dispersing agent in the same amount.

EXAMPLE 3

The general procedure of Example 2 was repeated, but one half (438.9 g) of the polypropylene wax was replaced by an equal weight of isotactic polypropylene. The wax was fused first at about 170°C with kneading, and the isotactic polypropylene was added thereafter. A pigment composition having properties similar to those described in Example 2 was obtained.

Only minor and usually insignificant changes in the properties of the pigment composition are caused by selecting polypropylene waxes varying in melting temperature between approximately 110° and 150°C., and the choice of dispersing agent also has not much influence on the result, as long as the dispersing agent does not break down at the temperature at which it is processed. Some suitable dispersing agents have been referred to in the Examples, and it will be appreciated that they may be interchanged or that others may be substituted, for example, sorbitan monolaurate, sorbitan monopalmitate, sorbitan monooleate, sorbitan trioleate, glycerol-sorbitan laurate, and polyoxyethylene sorbitan monooleate. Others will readily suggest themselves to those skilled in the art.

Temperature resistance is the only important limitation on the use of pigments, and only a few of those suitable for the invention can be enumerated here. Inorganic pigments which have been employed successfully include the oxides of iron and titanium and various grades of finely dispersed carbon, particularly lampblack and channel black. Many anthraquinone pigments, vat dyes, and chlorinated and non-chlorinated phthalocyanine dyes have the required temperature resistance. Members of the indigo group, quinacridon and disperse pigments, and pigments de-

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rived from perylene tetracarboxylic acid have been employed with good results.

It should be understood, therefore, that the foregoing disclosure relates only to preferred embodiments of the invention, and that it is intended to cover all changes and modifications in the examples of the invention herein chosen for the purpose of the disclosure which do not constitute departures from the spirit and scope of the invention set forth in the appended claims.

What is claimed is:

1. A pigment composition for coloring polypropylene essentially consisting of

- a. polypropylene wax as a carrier;
- b. a pigment uniformly dispersed in said carrier; and
- c. a non-ionic dispersing agent in an amount sufficient to disperse said pigment in said carrier at a temperature above the melting point of said carrier.

1. said pigment and said dispersing agent being stable at said temperature for a period sufficient to permit dispersing said pigment in the molten carrier.

2. A composition as set forth in claim 1, said temperature being between 160° and 180°C.

3. A composition as set forth in claim 1, further containing isotactic polypropylene as a diluent for said polypropylene wax.

4. A composition as set forth in claim 3, wherein the amount of said diluent is not greater than 80 percent of the combined weight of said carrier and of said diluent.

5. A composition as set forth in claim 1, wherein said dispersing agent has an HLB value of less than 10.

6. A composition as set forth in claim 3, wherein said

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dispersing agent is an ester of a polyhydric alcohol with an aliphatic monocarboxylic acid having 12 to 18 carbon atoms.

7. A composition as set forth in claim 1, wherein said amount is 1 to 5 percent of the weight of said composition.

8. A composition as set forth in claim 7, wherein said pigment is an organic pigment, the weight of said pigments being approximately 35 to 40 percent of the weight of said composition.

9. A composition as set forth in claim 7, wherein said pigment is an inorganic pigment, the weight of said pigment being approximately 60 to 80 percent of the weight of said composition.

10. A method of preparing a pigment composition suitable for coloring polypropylene which comprises intimately mixing a pigment with polypropylene wax as a carrier and with an effective amount of a nonionic dispersing agent at a temperature at which said wax is liquid until a homogeneous viscous mass is obtained, cooling said mass until solidified, and comminuting the solidified mass.

11. A method as set forth in claim 10, wherein the weight of said dispersing agent is 1 to 5 percent of the weight of said mass, and the weight of said pigment is 10 to 40 percent when said pigment is an organic pigment, and 10 to 80 percent when said pigment is an inorganic pigment.

12. A composition as set forth in claim 1, wherein said dispersing agent is uniformly dispersed in said carrier.

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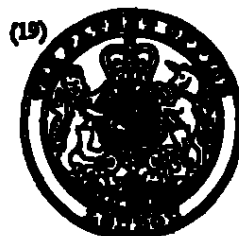
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PATENT SPECIFICATION

(11) 1 541 091

1 541 091

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(23) Complete Specification filed 25 March 1977
(44) Complete Specification published 21 Feb. 1979
(51) INT CL³ C08J 3/22
(52) Index at acceptance
C3L 402 DA
(72) Inventors MICHAEL FRANK BYRNE



(54) MASTERBATCHES FOR COLOURING POLYMERS AND COPOLYMERS

(71) We, SOUTHWEST PLASTICS EUROPE S.A., a Company organised under the laws of Belgium, of Rue Prevochamps, 4860-Pepinster, Belgium, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The invention relates to masterbatches for colouring polymers and copolymers; more particularly, it relates to masterbatches which may be mainly used for colouring modifying or imparting particular properties to polymers, such as polyolefins, for example polyethylene and polypropylene, polystyrene and polyvinyl chloride, as well as copolymers, such as acrylonitrile-butadiene-styrene (ABS) copolymers.

It is known to prepare such masterbatches by mixing fillers and pigments to a total of about 75%, by weight, with low density polyethylene, high density polyethylene, ethylene/vinyl acetate copolymers or isotactic polypropylene. Presently known masterbatches may also contain lubricants, such as stearic acid, metallic stearates (e.g. calcium or aluminium stearates) or waxes. Typical percentages of these lubricants are up to 2% for metallic stearates and 15% for waxes.

The fillers used in the masterbatches may be calcium carbonate, clay, silica or talc. Various pigments may be used in these masterbatches, namely titanium dioxide, carbon black, organic dyes, organic pigments and inorganic pigments. Other additives, such as antimony trioxide and halogenated paraffins, may be used with or without colouring material, to confer various properties, such as flame retardancy.

The masterbatches in question are mixed, generally in an amount of from 2 to 4%, by weight with granules or powder of

an uncoloured polymer, the resulting mixture then being used for moulding or extruding, for example films, sheets, pipes, or cables.

It has now been found that it is advantageous to replace all or part of the low density polyethylene, high density polyethylene, ethylene/vinyl acetate copolymers or isotactic polypropylene used in the masterbatches by atactic polypropylene.

Atactic polypropylene is normally a waste product from the manufacture of normal or isotactic polypropylene. It is difficult to dispose of and must often be thrown away or even burnt.

The present invention provides a masterbatch for colouring and/or modifying a polymer or copolymer which comprises not more than 25%, by weight, based on the masterbatch, of atactic polypropylene, at least one polymer selected from low density polyethylene, high density polyethylene, isotactic polypropylene and ethylene/vinyl acetate copolymers and at least one pigment and/or modifying agent.

The use of atactic polypropylene in the masterbatches according to the present invention has several advantages.

Since atactic polypropylene is a waste and therefore cheap product, the masterbatches according to the present invention are substantially cheaper than the low density polyethylene-containing masterbatches used heretofore.

Moreover, the masterbatches according to the present invention are softer than the previously known masterbatches and may more readily be diluted when mixed with granules of polymers so as to obtain mixtures for moulding or extruding shaped products.

It is however possible, when using atactic polypropylene, to increase the filler and/or pigment contents of the masterbatches, without affecting the softness and dilutability of the masterbatch.

It is known that the presence of atactic

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polypropylene in extruded or moulded products may detrimentally effect the physical properties of these products. It has been found that, since the masterbatches according to the present invention have a high solids content and do not contain more than 25% by weight, of atactic polypropylene, this atactic polypropylene is only introduced in a very small amount (from 0.5 to 1% by weight) in the extruded or moulded product, this amount being insufficient to substantially impair the physical properties of the extruded or moulded products.

According to one embodiment of the present invention, calcium carbonate having a particle size of from 0.5 to 15 microns, preferably from 0.5 to 4 microns, is advantageously used as one of the fillers in the masterbatches. This particular filler acts as an antiblock agent, which removes the difficulties of use of the masterbatch, due to the inherent stickiness of the atactic polypropylene contained therein.

Among the lubricants which may be used in the masterbatches according to the present invention, stearates, such as calcium stearate or aluminium stearate, high molecular weight organic acids, such as stearic or palmitoleic acids, as well as other known lubricants, such as waxes or plasticizers, may be mentioned.

When the masterbatch according to the present invention contains a white pigment, such as titanium dioxide, it is advantageous to add a small proportion, for example from 1 to 5% by weight, of an agent which is capable of stopping or avoiding the yellowing in the presence of the pigment, which may happen slowly under the influence of certain conditions of light and in the presence of certain substances, such as antioxidants containing a phenolic group, such agent being, for example, citric acid or stearic acid. Such yellowing may occur either in the masterbatch or in compounds made by diluting the masterbatch.

The masterbatch according to the present invention preferably contains from 40 to 90%, by weight, of at least one pigment, from 0 to 40%, by weight, of a filler, preferably calcium carbonate, from 0 to 5%, by weight, of a lubricant and not more than 25%, by weight, of atactic polypropylene, optionally mixed with at least one other polyolefin selected from low density polyethylene, high density polyethylene and isotactic polypropylene or an ethylene/vinyl acetate copolymer.

The atactic polypropylene contained in the masterbatch according to the present invention may have any molecular weight.

The present invention also relates to a

mixture to be used for extending or moulding shaped products, such as films, sheets, pipes or cables, containing from 80 to 99%, by weight of a polymer, such as a polyolefin, in particular polyethylene or isotactic polypropylene polystyrene, polyvinyl chloride or ABS, as well as from 1.0 to 20%, by weight, of a masterbatch according to the present invention, i.e. a masterbatch containing atactic polypropylene, preferably in an amount not exceeding 25%, by weight.

The following Examples illustrate the present invention. The masterbatches described in these Examples were prepared by mixing the listed ingredients.

EXAMPLE 1

Ingredients	% by weight	
SRF carbon black	47.5	85
Calcium carbonate	23.8	
Low density polyethylene (MFI 20)	15.0	
Atactic polypropylene	13.7	
	100.0	

* Melt flow index at 190°C and 2.16 kg 90

EXAMPLE 2

Ingredients	% by weight	
Rutile titanium dioxide	90.0	95
Calcium carbonate	25.0	
Low density polyethylene (MFI 20)	12.5	
Atactic polypropylene	12.5	
	100.0	

EXAMPLE 3

Ingredients	% by weight	
SRF black	40	105
Calcium carbonate	25	
Calcium stearate	2	
Low density polyethylene	23	
Atactic polypropylene	10	

EXAMPLE 4

Ingredients	% by weight	
Titanium dioxide	30	110
Calcium carbonate	35	
Calcium stearate	1	
Citric acid	1	
Low density polyethylene (MFI 20)	6.5	115
Atactic polypropylene	6.5	

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	EXAMPLE 5		
	Ingredients	% by weight	
5	SRF black	40	
	Calcium carbonate	25	
	Aluminium stearate	1	
	Low density polyethylene (MFI:20)	12	
	High density polyethylene	12	
10	Atactic polypropylene	10	
	EXAMPLE 6		
	Ingredients	% by weight	
15	Titanium dioxide	50	
	Calcium carbonate	35	
	Stearic acid	1	
	High density polyethylene	3.25	
	Isotactic polypropylene	3.25	
	Atactic polypropylene	6.5	
20	EXAMPLE 7		
	Ingredients	% by weight	
	SRF black	40	
	Calcium carbonate	25	
25	Calcium stearate	1	
	Low density polyethylene	12	
	Isotactic polypropylene	12	
	Atactic polypropylene	10	
30	EXAMPLE 8		
	Ingredients	% by weight	
	Titanium dioxide	50	
	Calcium carbonate	34	
	Aluminium stearate	1	
35	Citric acid	1	
	Low density polyethylene	2	
	High density polyethylene	3	
	Isotactic polypropylene	2	
	Atactic polypropylene	8	
40	EXAMPLE 9		
	Ingredients	% by weight	
	SRF black	40	
	Calcium carbonate	24	
45	Calcium stearate	2	
	Low density polyethylene	8	
	High density polyethylene	8	
	Isotactic polypropylene	8	
	Atactic polypropylene	10	
50	EXAMPLE 10		
	Ingredients	% by weight	
	Rutile titanium dioxide	50	
	Calcium carbonate	25	
55	High density polyethylene	10	
	Atactic polypropylene	15	
	EXAMPLE 11		
	Ingredients	% by weight	
	Antimony trioxide	25	60
	Chlorinated paraffin	25	
	Low density polyethylene	35	
	Atactic polypropylene	15	
	EXAMPLE 12		
	Ingredients	% by weight	
	Titanium dioxide	50	65
	Calcium carbonate	25	
	Ethylene/vinyl acetate copolymer	12.5	70
	Atactic polypropylene	12.5	
	WHAT WE CLAIM IS:—		
	1. A masterbatch for colouring and/or modifying a polymer or copolymer which comprises not more than 25% by weight, based on the masterbatch, of atactic polypropylene, at least one polymer selected from low density polyethylene, high density polyethylene, isotactic polypropylene and ethylene/vinyl acetate copolymers and at least one pigment and/or modifying agent.	75	
	2. A masterbatch as claimed in claim 1 comprising at least one filler and/or lubricant.	85	
	3. A masterbatch as claimed in claim 2 in which the filler is calcium carbonate.		
	4. A masterbatch as claimed in claim 3 in which the calcium carbonate has a particle size of from 0.5 to 15 microns.	90	
	5. A masterbatch as claimed in claim 4 in which the particle size is from 0.5 to 4 microns.		
	6. A masterbatch as claimed in any of claims 1 to 5 comprising an organic acid for preventing yellowing in the presence of white pigment(s).	95	
	7. A masterbatch as claimed in claim 6 in which the organic acid is stearic acid and/or citric acid.	100	
	8. A masterbatch as claimed in any of claims 2 to 7 in which the lubricant is a metal salt of stearic acid, a wax, a plasticizer or a mixture thereof.		
	9. A masterbatch as claimed in any of claims 1 to 8, comprising from 40 to 90% by weight, of pigment.	105	
	10. A masterbatch as claimed in any of claims 1 to 9, comprising from 0 to 40% by weight, of filler.	110	
	11. A masterbatch as claimed in any of claims 1 to 10, comprising from 0 to 5% by weight, of lubricant.		
	12. A masterbatch as claimed in claim 1 substantially as herein described.	115	
	13. A masterbatch as claimed in claim 1		

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	substantially as herein described with reference to any one of the Examples.	in which the polyolefin is polyethylene or isotactic polypropylene.	
5	14. A process for the production of a masterbatch as claimed in claim 1 which comprises mixing the components.	21. A composition as claimed in claim 18 substantially as herein described.	30
	15. A process as claimed in claim 14 substantially as herein described.	22. A process for the production of a composition as claimed in claim 18 which comprises incorporating the masterbatch in the polymer or copolymer.	
10	16. A process as claimed in claim 14 substantially as herein described with reference to any one of the Examples.	23. A process as claimed in claim 22 substantially as herein described.	35
	17. A masterbatch when produced by a process as claimed in any of claims 14 to 16.	24. A composition when produced by a process as claimed in claim 22 or claim 23.	
15	18. A composition for extruding or moulding shaped products which comprises from 80 to 99%, by weight, of an uncoloured and/or unmodified polymer or copolymer and from 1.0 to 20%, by weight, of a masterbatch as claimed in any of claims 1 to 13 or 17.	25. A process for the production of a shaped article which comprises extruding or moulding a composition as claimed in any of claims 18 to 21 or 24.	40
20	19. A composition as claimed in claim 18 in which the polymer is a polyolefin, polystyrene, polyvinyl chloride, a copolymer of acrylonitrile, butadiene and styrene or a copolymer of ethylene and vinyl acetate.	26. A process as claimed to claim 25 substantially as herein described.	
25	20. A composition as claimed in claim 19	27. A shaped article when produced by a process as claimed in claim 25 or claim 26.	45

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Abstract of JP10001572

PROBLEM TO BE SOLVED: To obtain a colorant composition which is used for polypropylene, can be easily granulated in the step of producing a colorant and can contain a pigment in high concentration with good distribution without detriment to the physical properties of a colored resin by using specified polypropylenes as the carrier resin for a colorant composition (master batch color). **SOLUTION:** This composition is composed mainly of a pigment and a carrier resin comprising a mixture of an isotactic polypropylene and a syndiotactic polypropylene at a weight ratio of (19:1) to (1:1). The MFR of the isotactic polypropylene is preferably at least 10g/10. It is desirable that the carrier resin contains a modifier as the auxiliary component so that the performance can be thereby improved. The modifier preferably comprises a polyolefin or its derivative.

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[0018] When coloring use of the granular coloring agent using support resin other than polypropylene was considerably carried out in the polypropylene (a compound is called) referred by polypropylene, the copolymer or an inorganic fine particle, etc., the fall of coloring resin physical properties arose, when there were low spreading ability, and an irregular color increased, and the spreading rate had caused many addition phenomena of support resin on the front face of coloring mold parts depending on the process condition conversely.

[0019] Therefore, the approach using the hypoviscosity isotactic polypropylene to aim at distribution amelioration and physical-properties maintenance using used isotactic polypropylene and ATAKOD-8000 as the principal component, and carried out viscosity control to the support resin of a granular coloring agent is used variously, and it is [isotactic polypropylene] high MFR is proposed by the patent application of Japanese Patent Application No. No. (May 30 application) 101888 [seven to].

[0020] It was in such a situation, and this invention person admitted that the balance of distributivity and resin physical properties was [rather than] good using resin other than a polypropylene, when isotactic polypropylene and syndiotactic polypropylene were used as the support resin of a granular coloring agent. Especially the isotactic polypropylene used together is effective when the thing of a high fluidity (MFR is large) raises the fluidity of the granular coloring agent which contains a pigment by high concentration.

[0021] Originally, that viscosity in a melting condition cannot be easily influenced of a shear rate as compared with isotactic polypropylene, with a high shear rate, syndiotactic polypropylene is contributed also to both toughness improvements of isotactic polypropylene as the viscosity balance from a low speed to high-speed shearing becomes good according to constant use with high fluidity isotactic polypropylene although viscosity is high, and as for the coloring color polypropylene by the granular coloring agent which made this support resin, distributivity and physical properties become good.

[0022] Isotactic polypropylene and syndiotactic polypropylene are 10:1-1:1 in a weight ratio, and also rigidity will be lost if many [if there is too little syndiotactic polypropylene, resin physical properties, such as toughness will not be improved, and / too], such a desirable combination ratio of support resin is not desirable.

[0023] The isotactic polypropylene used by this invention may be resin compounded by a Ziegler-Natta system catalyst and a metallocene system catalyst and other catalysts, and may be styrene and a copolymer with alpha-olefin. Discrepancy is good as an isotactic partial molar fraction in being more than the value of syndiotactic polypropylene outside of 90% or more, although MFR should just be ten or more, and in order to raise a fluidity, it is still better desirably to add 100 or more things.

[0024] Moreover, said support resin of adding a modifier and sharing at an angle-performance improvement is also effective in it, and has polystyrene or its derivative as the modifier. The single polymer and copolymer which are compounded with a Ziegler-Natta system or a metallocene system catalyst in olefins including an unsaturated bond are mixed, and this contains plural copolymer including two or more monomeric units in a copolymer. And if only these use isotactic polypropylene and its compounds, and an approach that dissolves, it cannot add a limit at all. For example, oligomerolysis, such as an olefin / styrene system copolymer, such as polyethylene, olefin polypropylene, ethylene-propylene copolymer, ethylene / butene-1 copolymer, a propylene / butene-1 copolymer, styrene / propylene / ethylene, HCR/BO-MEN ternary polymerization object, the Part 4 methyl partens 1 styrene / styrene / butene / styrene copolymer (BEM), and hydrogenation styrene / butene rubber (HBR), and EEA, EVA, beta-unsaturated-carboxylic-acid copolymer etc. can be mentioned.

[0025] In this invention, although the polycyclic as these modifiers or the molecular weight of the derivative changes with change of monomer constituted, it is usually 600-1 million, and can be orally used for powder. The configuration of granular or a copolymerization rate without a limit. Moreover, even if it makes these resin involves the acid radical of alpha, such as an acrylic acid, a methacrylic acid, an ETAKURERU acid, a maleic acid, a fumaric acid, and an itaconic acid, beta-unsaturated carboxylic acid, or its anhydride into a molecule by other treatment, at this invention, there is no inconvenience in any way.

[0026] as such a thing -- Mitsui -- San Wada (trade name) of Formosa, and JBR of Japan Synthetic Rubber Co., Ltd. EP (trade name) -- TR (trade name), Olin Pan (trade name), the high wax of Mitsui Petrochemical (trade name), TARUMA (trade name), four cent (trade name), Mitsui IPT (trade name), TPR (trade name), the FRON (trade name) of Mitsui I. L. du Pont de Nemours, P.E.L.A. of Tokuyama (trade name), Clayton G (trade name) of S. FLORIN (trade name) of the tough tooth (trade name) of Asahi Chemical and Sumitomo Chemical Co., Ltd. engagement (trade name) of the Deer Chemical, and shell chemistry etc. can be mentioned.

[0027] Although a pigment is an indispensable component and 5-80 % of the weight is contained in a granular coloring agent in this invention, it is desirable to use it, improving distribution. The pigment used by this invention is well-known in the plastic coloring field, for example, has organic pigments, such as inorganic pigments, such as titanium oxide, a zinc oxide, rouge, a titanium oxide system baking pigment, ultramarine blue, ultramarine blue, ultramarine blue, and carbon black, an azo system, the Quinacridone system, the Anthraquinone system, a perylene system, an isoindolinone system, a phthalocyanine system, a bay PUTANON system, the indanthrene system, and a diazo pyrazole pyrazole system, and extenders, such as a barium sulfate and a calcium carbonate.

[0028] Moreover, in this invention, well-known pigment agents, such as a fatty acid, a fatty-acid metal salt, fatty acid ester fatty-acid AMAXO, and a surfactant, a thionocarbonyl light stabilizer, a flame retarder, a plasticizer, an antioxidant agent, lubricant, a reinforcing additive, or a bulking agent can be added if needed.

[0029] Although the percentage of the component except a pigment is 90-30 % of the weight, the mixture of specific polypropylene should just constitute the coloring agent constituent of this invention 40 to 100% of the weight in this removed component so that a modifier and other components may become 60-0 % of the weight.

[0030] In addition to this, the granular coloring agent of this invention mixes a component with a coloring agent constituent indispensable component, improves melting spreading and is obtained. Although it was that this invention person does not expect although the configuration of a branding object is used as a granular object by the hot cut depending on how to take out from a branding machine or it is made by considering as a sheet or the granular object by the cold cut of a strand, if a granular coloring agent is produced by cold cut, division with the cutter (cutter) which has a rotary knife will be improved remarkably, and generating of the scraps by poor clipping of a granular object will be reduced.

[0031] Usually, although it is easy to generate the scraps in the cutter by cold cut, and a branding extruder delivery is equipped with hot cut equipment or the scraps stripper by Air suction and the brandon is installed in it the more the more a pigment is included in high concentration, these equipments are not needed in the coloring agent of this invention, but it is convenient.

[0032] A granular coloring agent is produced at the following processes. For example, after mixing with low-molecular-weight olefin system resin with the high speed mixer etc. beforehand, kneading with a Banbury mixer or a kneader after mixing and pulverizing the pigment with a well-known pigment agent and a well-known high speed mixer, and the granular or sand grinding processing is mutually carried out with a ring heating roll or a ring heating roll. In addition to this, it kneads [isotactic polypropylene / syndiotactic polypropylene and] with a component with kneading machines, such as a monospind screw and a knead screw extruder. Or all these components are mixed at once and melting kneading is carried out with a Banbury mixer, a kneader, a high-speed rotation intensive mixer, a monospind screw, a knead screw extruder etc.

[0033] The granular coloring agent of this invention makes applicable to coloring the polypropylene compounded with the polypropylene which determined by isotactic polypropylene, syndiotactic polypropylene, and the comonomer, the polymer alloy with other polyethylenes, the above-mentioned bulking agent, etc. It is suitable for the high crystallinity polypropylene of which especially high physical properties are required, or the polypropylene compounded with various modifiers or a bulking agent using it. Although dilution contribution of the coloring agent is carried out so that it may become desired pigment concentration, it is usually blended below in 10 weight ratio to the covering color resin 100 weight ratio.

[0034] [Example] Next, although an example and the example of a comparison are given and this invention is explained concretely, this invention is not limited to these examples, but has the broad application range. In addition, all of the section in an example and the example of a comparison and % display are weight ratio.

[0035] A red iron oxide examples 1 and 2, the example 1 of a comparison, given in the 4 table 1 (C.I.P.R.101), black iron oxide (C.I.P.R.101), iron yellow (Fe-rich-TiO₂), C. After mixing LPY.05 and a titanium oxide (titanium oxide C.I.P.W.8) pigment, low molecular weight polystyrene, and also alumina with a high speed mixer with a corresponding ratio (section) given in Table 1 respectively, it was made the good indanthrene mold granular object of pigment-concent powder by grinding the kneading object which carried out heating melting kneading and carried out grinding processing mutually with 5 rolls continuously the pre-treated kneader by the crusher. After mixed this granular object with a specific polypropylene constituent given in Table 1 conventional polypropylene, or styrene resin with the corresponding ratio given in Table 1 respectively, having carried out melting kneading with the monospind screw extruder (ratio-of-length-to-diameter=27), having extruded in the shape of a strand, carrying out and cooling in a tank with a water temperature of 30 degrees C, it was processed into the cylindrical shape master-batch color pellet 100 weight ratio with a die length of 8-mm in the rotary knife cutting-die pelletizer. The injection-molding irregular color evaluation test and the physical-properties test were presented with it while the obtained masterbatch color investigated mixing of powdery scraps.

[0036] Although the result was indicated to Table 2, the masterbatch color of this invention presentation did not have and powder and did not almost have an irregular color differ, and the retention of many physical-properties values was 90% or more.

[0037] In addition, the injection-molding irregular color evaluation approach and the physical-properties test method are as follows.

Injection-molding irregular-color evaluation test: Fabricate [with the injection molding machine of 60 of clamping pressure of full close-bladed-screw (ratio-of-length-to-diameter=30) wearing] mixture in 2 to direct gate disk mold (2mm in a diameter 100, thickness) the molding temperature of 230 degrees C, the die temperature of 40 degrees C, and the back pressure of 0.1Mpa after mixing [to polypropylene or a polypropylene constituent given / a masterbatch color / in a table] in addition with the dilution ratio (%) of a publication to a table.

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[0036] Evaluation of an irregular color is performed by the size of **** accepted on a disk.

Injection-molding physical-property test: Fabricate mixture in 2 at physical-property place mold mold the molding temperature of 210 degrees C, the die temperature of 40 degrees C, and the back pressure of 20kg/cm² with the injection molding machine of 50t of clamping pressure of full close-locked-screw (ratio-of-length-to-diameter=20) waiting after molding [to polypropylene or a polypropylene constituent given / a masterbatch color / in a table] in addition with the dilution ratio (%) of a publication to a table. The tensile test, the bending test, the IZOD impact test, and the heat deformation trial (HDT) were presented with shaping place.

[0038] Validation basis: Express the retention of a coloring resin physical-property value as the following criteria, using the physical-property value of non-colored resin as 100.

O x whose retention of **physical-property value whose retention of physical-property value is 95% or more is 90% or more less than 90% [0040] whose retention of a physical-property value is less than 90%

EFFECT OF THE INVENTION

[Effect of the invention] If the specific polypropylene of this invention is used as support resin of a masterbatch color when there are often no powder scraps, it is easy to granulate by the production process of a coloring agent, and a pigment can be contained in high concentration and it colors polypropylene and its composite, mechanical physical-property values, such as tensile strength of mold goods, **** ductility, a bending elastic modulus, impact strength, and heat deflection temperature, are not reduced, and an irregular color and **** are not started in the fabrication phase, but distributability can offer a good granular coloring agent.

[0057] Since removal of scraps becomes unnecessary and a pigment becomes usable [a high concentration coloring agent] from a coloring agent as a result, the amount of the coloring agent used decreases by this, and reduction of coloring costs and also drastic reduction of the shaping costs by improvement in a moldability can be aimed at.

Claim 1) The coloring agent constituent for polypropylene with which this polypropylene is the mixture of isotactic polypropylene and syndiotactic polypropylene, and the presentation ratio of the isotactic polypropylene in this mixture and syndiotactic polypropylene consists of weight ratio 10:1-1:1 in the coloring agent constituent which uses a pigment and support resin olefin polypropylene as a principal component.

[Claim 2] The coloring agent constituent for polypropylene whose MFRs of isotactic polypropylene according to claim 1 are 10g/10min or more.

[Claim 3] The coloring agent constituent according to claim 1 or 2 which contains the modifier of support resin as an necessary constituent.

[Claim 4] The coloring agent constituent according to claim 3 whose modifier of support resin is polyethylene or its derivative.

[Claim 5] Claims 1, 2, and 3 which are the granular coloring agents (masterbatch color) which contain a pigment five to 80% of the weight, and the coloring agent constituent of any one publication of four

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