

Señor

SUPERINTENDENTE DE INDUSTRIA Y COM.

DIVISION DE NUEVAS CREACIONES

E. \_\_\_\_\_ S. \_\_\_\_\_ D. \_\_\_\_\_

Re: P1.-SOCIETE DES PRODUITS NESTLÉ S.A.-Expediente  
número 01-022.577.-

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 **SOCIETE DES PRODUITS NESTLÉ S.A.**, una sociedad organizada y existente de conformidad con las leyes de Suiza, domiciliada en Vevey, Suiza.

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 **SOCIETE DES PRODUITS NESTLÉ S.A.**, otorgado a favor del **SUSCRITO (GUSTAVO TAMAYO)** y/o a la doctora ALICIA LLOREDA y/o al doctor IGNACIO SANTAMARIA y/o al doctor 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, de:

- (a) Documento que acredita al **SUSCRITO** y/o a la doctora ALICIA LLOREDA y/o al doctor IGNACIO SANTAMARIA y/o al doctor ENRIQUE ALVAREZ en los términos del parágrafo 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 **SOCIETE DES PRODUITS NESTLÉ S.A.**, una sociedad organizada y existente de conformidad con las leyes de Suiza, domiciliada en Vevey, Suiza;

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(b) Certificación Notarial expedida el 11 de Agosto de 2004; y

(c) Traducción Oficial No. 284/04 correspondiente a las partes pertinentes del documento anterior, también debidamente legalizada hasta por el Ministerio de Relaciones Exteriores bajo el número 061225 de 2 de Septiembre de 2004.

5. Finalmente, llamo la atención de ese Despacho al hecho de que la copia auténtica del documento que me acredita para actuar como Representante Legal de la sociedad peticionaria, reposa en el Expediente número **98-034.405**.

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

Señor Superintendente,

  
GUSTAVO TAMAYO

T.P. 37.172

Código 231

TRADUCCIÓN OFICIAL No.284/04 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 01 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.

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Autenticaciones que se hallan a continuación de un documento de poder conferido en inglés y español por **SOCIÉTÉ DES PRODUITS NESTLE S.A.**, una sociedad organizada y existe de conformidad con las leyes de Suiza, domiciliada en Vevey, Suiza, y otorgado a los Doctores **ALICIA LLOREDA y/o GUSTAVO TAMAYO y/o IGNACIO SANTAMARÍA y/o ENRIQUE ÁLVAREZ**, todos domiciliados en Bogotá, Colombia, Calle 72 No. 5 – 83 (Piso 6°).

Dado el 5 de agosto de 2004. Firma ilegible de la Señora Paula Nelson, con firma autorizada.

#### **CERTIFICADO NOTARIAL (SOCIEDAD)**

Legalización por parte del suscrito Notario de la firma de la Señora **Paula NELSON** quien desempeña el cargo de (en blanco) de la compañía **SOCIÉTÉ DES PRODUITS NESTLE S.A.**, una sociedad legalmente constituida y existente de acuerdo con las leyes de Suiza, domiciliada en Vevey (Suiza). Además, dicho Notario certifica que el signatario, según las leyes de Suiza, tiene facultad para otorgar el presente documento. Los hechos anteriores le constan por haber examinado los documentos respectivos el 13 de junio de 1997, y de todo ello da fe.

Firma de Jean-Daniel RUMPF. Sello: Jean-Daniel RUMPF – Notario.

Traducción Oficial No. 284/04  
JEAN - JACQUES H. TURPIN  
Traductor e Intérprete Oficial  
FRANCOIS - ESPAGNOL  
Res. Minjusticia No. 2680/91

8179

Legalización No. 7.136. El Notario Jean-Daniel RUMPF, en Vevey, Distrito de Vevey, Cantón de Vaud, Suiza, certifica la firma puesta en la página anterior por la Señora Paula Nelson, quien compromete en forma válida con su firma individual a la SOCIÉTÉ DES PRODUITS NESTLE S.A. en Vevey.

Dado en Vevey, el once de agosto de dos mil cuatro. Firma ilegible del Notario.

Sello: Jean-Daniel RUMPF – Notario. Estampilla de 4 Frs.

**APOSTILLA**

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

- 1. - País: Suiza  
El presente documento público
- 2. - ha sido firmado por el Señor Jean-Daniel RUMPF
- 3. - obrando en calidad de Notario en Vevey
- 4. - con sello de Jean-Daniel RUMPF, Notario

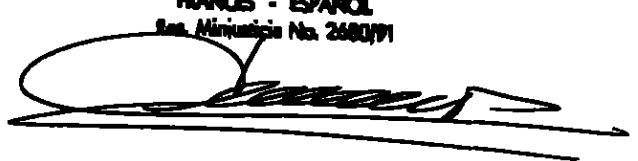
**CERTIFICADO**

- 5. - En Lausana
- 6. - El 12 de agosto de 2004
- 7. - Por la Cancillería de Estado del Cantón de Vaud
- 8. - Bajo el número 6706
- 9. - Sello: Cancillería del Consejo de Estado – Libertad y Patria - Emolumento de 25 Fr.
- 10. - Por el Canciller de Estado, firma de P. Equey.

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. 284/04.  
Traductor: Jean-Jacques Turpin.  
Bogotá, D.C., 1 de septiembre de 2004.

Traducción Oficial No. 284/04  
JEAN - JACQUES H. TURPIN  
Traductor e Interpretador Oficial  
FRANCÉS - ESPAÑOL  
Reg. Min. Justicia No. 2680/991



MINISTERIO DE RELACIONES  
EXTERIORES

*Juan Pardo*

661225

COYA FIRMA APARECE EN EL  
DOCUMENTO DESEMPENA  
LAS FUNCIONES DELEGADAS

NO SE ASUME  
RESPONSABILIDAD DEL TEXTO

2004 SEP -2 A 11: 08

*ULL*  
JEFE DE LEGALIZACIONES  
SANTAFE DE BOGOTA D.C.

Los abajo firmados, **SOCIETE DES PRODUITS NESTLE S.A.**, una sociedad organizada y existente de conformidad con las leyes de Suiza

con domicilio en **Vevey, Suiza**

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The undersigned, **SOCIETE DES PRODUITS NESTLE S.A.**, a corporation organized and existing under the laws of Switzerland.

domiciled at **Vevey, Switzerland**

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 hicieren 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

hereby appoint, **ALICIA LLOREDA and/or GUSTAVO TAMAYO and/or IGNACIO SANTAMARIA and/or ENRIQUE ALVAREZ**, of Bogota, Colombia, with offices in said town, Calle 72 No. 5-83, Sixth 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 LL REDA 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 (date): 5th August 2004

Paula NELSON - Authorized Signatory



NOTARY SHOULD EXECUTE OTHER SIDE

CERTIFICADO NOTARIAL (SOCIEDAD)

Sulza  
Vevey

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Hoy 11 de Agosto de 2004  
compareció

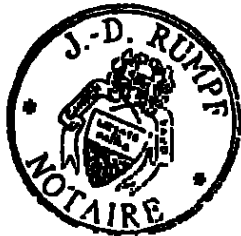
PAULA NELSON

a quien conozco y

de quien me consta que firmó el anterior documento,  
y quien debidamente juramentado declaró y dijo que  
él es la persona autorizada por sus-  
cribir documentos de SOCIETE DES  
PRODUITS NESTLE S.A., la compañía nombrada en  
el documento que antecede, una sociedad  
debidamente organizada y existente conforme a las  
leyes de Sulza, domiciliada en la ciudad de  
Vevey, Sulza legalmente constituida para un período  
de duración que aún no ha terminado, que ejerce su  
objeto social; conforme a las leyes de Sulza, 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.

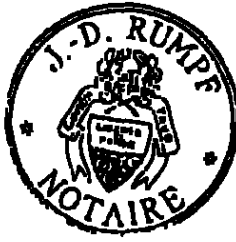
El suscrito Notario ha visto los Estatutos de  
incorporación firmados en Vevey, Sulza, con fecha  
Noviembre 27, 1936, y certifica que de conformidad  
con la legislación de dicho País, la anterior  
declaración juramentada es prueba suficiente de que  
los hechos sobre que ella versa son ciertos o  
verdaderos, de lo cual da fe.

Notary Public (Notario Público).



Légalisation No 7'136.-

Le notaire JEAN-DANIEL RUMPF, à Vevey, District de Vevey, Canton de  
Vaud, Suisse, certifie authentique la signature apposée d'autre ---  
part par Mme Paula NELSON, laquelle engage valablement la SOCIETE -  
DES PRODUITS NESTLE SA, à Vevey, par sa signature individuelle. ----  
VEVEY, LE ONZE AOÛT DEUX MILLE QUATRE. -----



J.D. Rumpf

NOTARIAL CERTIFICATE (CORPORATION)

Switzerland  
Vevey

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On this 11th day of August 2004,  
personally  
came Paula NELSON

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/she is the  
Authorized Signatory of SOCIETE DES PRODUITS  
NESTLE S.A., the company named within, a  
Corporation organized and existing under the laws of  
the Switzerland, domiciled at the City of Vevey,  
Switzerland legally constituted for a period of tenure  
not yet expired, which exercises its corporate  
purposes according to the laws of Switzerland, 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  
Vevey, Switzerland, under date of November 27,  
1936, 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. 1 June 13, 1997

**APOSTILLE**  
(Convention de La Haye du 5 octobre 1961)

1. Pays: SUISSE

Le présent acte public

2. a été signé par Jean-Daniel Rumpf

3. agissant en qualité de notaire à Vevey

4. est revêtu du sceau/timbre de J.-D. Rumpf notaire



Attesté

5. à Lausanne

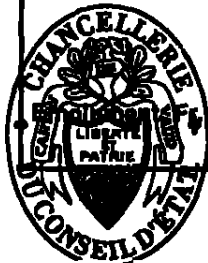
6. le 12 août 2004

7. par la Chancellerie d'Etat du Canton de Vaud

8. sous No 6708

9. Sceau/timbre:

10. Signature  
pr le Chancelier d'Etat:



25.-

*P. Equey*

P.Equey

**DIVISION DE NUEVAS CREACIONES**

**RADICACIÓN EXPEDIENTE No. 01- 22577**

**EL EXTRACTO DE LA PRESENTE SOLICITUD DE PATENTE DE INVENCION  
FUE PUBLICADO EN LA GACETA DE PROPIEDAD INDUSTRIAL No 522, DE  
FECHA 28 DE NOVIEMBRE DE 2002, EL TERMINO HABIL SEÑALADO POR  
LA LEY EXPIRA EL 25 DE FEBRERO DE 2003.**

**NOTA: Dentro del plazo de los seis (6) meses siguientes a partir de la fecha de publicación en la gaceta de Propiedad Industrial, deberá solicitar y cancelar el examen de patentabilidad so pena de que la solicitud caiga en abandono, de acuerdo con lo establecido en el Artículo 44 de la Decisión 486/2000.**

**SE PRESENTARON OPOSICIONES POR PARTE DE TERCEROS.**

**SI**                 

**NO**        **X**

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

2020

Bogotá, D.C.

Doctora

Alicia Lloreda Ricaurte  
Apoderada

Oficio No. 4579

**REFERENCIA: Radicación No. 01- 22577  
Trámite 002  
Evento 001  
Actuación 430  
Folios 019**

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.**

- Capítulo descriptivo: folios 8 al 15
- Capítulo reivindicatorio: folios 16 al 19

Se acepta reivindicación de prioridad GB 0007249.6 del 24 de Marzo de 2000 y prioridad GB 0016840.1 del 7 de Julio de 2000.

**2. OBJETO DE LA INVENCION.**

**Título: "Galleta bañada"**

La invención se refiere a :

- Un procedimiento para preparar una galleta bañada con un componente de mayor humedad que tiene un baño de barrera entre la galleta y el componente de mayor humedad caracterizado porque el baño de barrera es una mezcla de manteca de alta temperatura de fusión y azúcar flor que comprende la fusión de la mezcla de una manteca de alta temperatura de fusión y azúcar flor que comprende la fusión de la mezcla de de una manteca de alta temperatura de fusión y azúcar flor y su aplicación a la galleta, usando una técnica en que el componente central se hace caer o rotar y finalmente la galleta bañada con el baño de barrera se pone en contacto con el componente de mayor humedad. El baño de barrera se aplica a la galleta usando un equipo de fabricación de galletas, el baño de barrera se aplica a la galleta haciéndola rotar entre fibras o escobillas suaves.

- Una galleta que se fabrica con el procedimiento descrito anteriormente, el baño de barrera es una mezcla de una manteca de alta temperatura de fusión y azúcar flor en una proporción de 15 a 50% , la galleta que se va a someter a baño tiene un contenido de humedad 1 a 5% por peso. La manteca de alta temperatura de fusión es una manteca vegetal hidrogenada que tiene un punto de fusión de 45 a 100C. El componente de mayor humedad es caramelo, mermelada, turrón, mallow o fondant. El caramelo que está en contacto con la galleta contiene como ingredientes básicos: azúcar, jarabe de glucosa, proteína láctea, manteca, sal y de 5 a 15% de agua.

Clasificación Internacional de Patentes: A21D 13/00

### 3. CLARIDAD DE LA SOLICITUD.

De acuerdo a la Decisión 486 de la Comisión de la Comunidad Andina en su Artículo 30.- *"Las reivindicaciones definirán la materia que se desea proteger mediante la patente. Deben ser claras y concisas y estar enteramente sustentadas por la descripción"*; se hacen las siguientes observaciones al capítulo reivindicatorio:

En la reivindicación 1 se esta presentando un procedimiento para la preparación de una galleta bañada; en el cual se observan las siguientes tres etapas: fusión de la mezcla que constituye el baño de barrera, aplicación a la galleta y poner en contacto la galleta bañada con el componente de mayor humedad. Estas etapas se encuentran descritas de una forma muy general y no presentan las condiciones en las cuales se lleva a cabo cada etapa; por lo que en esta reivindicación hace falta claridad y concisión ya que no se esta delimitando la materia que se desea proteger.

La reivindicación dependiente 2 esta caracterizando una de las etapas del proceso por el uso de un equipo para fabricar galletas; lo cual no es consistente ya que se debería caracterizar cada etapa del proceso en términos de las condiciones en las cuales dicha etapa se lleva a cabo.

Tal como se encuentra presentado el procedimiento este no permite vislumbrar el componente técnico nuevo e inventivo; además el uso de la máquina para fabricar galletas es conocido tal como se manifiesta en el capítulo descriptivo (folio 9).

La reivindicación 5 presenta una galleta bañada la cual no se encuentra definida en términos de la composición de la misma ya que se esta definiendo por la composición de la mezcla que constituye el baño de barrera; por lo tanto en esta reivindicación se debería definir la galleta en términos de todos sus componentes y proporciones de los mismos. Según como se encuentra planteada dicha reivindicación lo nuevo e inventivo de la galleta sería el baño de barrera solamente. De acuerdo a lo anterior, el capítulo reivindicatorio carece de claridad y concisión ya que no define la galleta con todos sus componentes.

A lo largo del capítulo reivindicatorio se presentan los componentes del baño de barrera de una forma general por lo que se deberían especificar.

De otra parte las reivindicaciones dependientes 6 a 10 se encuentran definiendo los componentes de la galleta bañada y recubierta, lo que no es consistente con lo expuesto en la reivindicación independiente 5 ya que en ella se está presentando la composición del baño de barrera.

En la solicitud la materia no se encuentra suficientemente sustentada ya que si el problema técnico a resolver consiste en que el baño de barrera impide la migración de humedad del componente de mayor humedad hacia el componente seco de la galleta, no se presentan las pruebas que demuestren que este hecho ocurra. En el capítulo descriptivo se indica que el producto que contenga este baño de barrera va a presentar un mayor tiempo de duración que los productos que presentan cubiertas de chocolate pero no se presentan los datos que llevan a tal conclusión.

Se le recuerda al solicitante que las modificaciones que se consideren para el capítulo reivindicatorio no deben contener materia nueva con respecto a la presente solicitud.

Según las observaciones anteriormente realizadas, la solicitud no cumple con el artículo 30 de la Decisión 486 y se deben realizar los ajustes necesarios para continuar con el trámite correspondiente de la solicitud. De acuerdo a los cambios que se realicen a la solicitud se debe ajustar el título de la misma.

#### **4. DETERMINACIÓN DEL ESTADO DE LATÉCNICA**

Según la definición dada en el art. 16.- "Una invención se considerará nueva cuando no está comprendida en el estado de la técnica.

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." , se realizó la búsqueda de anterioridades en los archivos con que cuenta esta Oficina y se encontraron los siguientes documentos relacionados con la materia de la presente solicitud:

| <b>N°</b> | <b>DOCUMENTO</b> | <b>TITULO</b>                                     | <b>FECHA DE PUBLICACION</b> |
|-----------|------------------|---------------------------------------------------|-----------------------------|
| D1        | US 5,340,598     | Method for producing spherical shaped baked goods | 1994-08-23                  |
| D2        | US 4,820,533     | Edible barrier for composite food articles        | 1989-04-11                  |
| D3        | US 4,214,012     | Fat Composition                                   | 1980-07-22                  |

Los documentos presentados se anexan al expediente.

## 5. EVALUACIÓN DE LOS REQUISITOS DE PATENTABILIDAD

El artículo 14 de la Decisión 486 de la Comisión de la Comunidad Andina establece que: "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 del artículo 14 de la Decisión 486, 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.

### 5.1. Evaluación de NIVEL INVENTIVO

De acuerdo al art. 18.- *"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"*. se conceptúa:

La anterioridad D1 presenta un método para la fabricación de productos de panadería que tienen forma esféricas tales como galletas o snacks; basados en masa de harina de farináceas. La masa es cortada en piezas de forma redonda o esférica o cilíndrica las cuales se hornean o cocinan parcial o totalmente. Las piezas horneadas son suficientemente redondas o esféricas para permitir una continua aplicación de recubrimientos de repostería de espesor uniforme.

La anterioridad D2 presenta una barrera comestible utilizada en alimentos para separar una parte de un alimento de la otra, esta difiere en propiedades tales como actividad de agua, concentración de proteínas, etc. Estas barreras comestibles son altamente resistentes a la migración de la humedad entre las fases en las cuales se encuentran, también son resistentes a la degradación por humedad y/o grasas. Estas barreras también proporcionan buen soporte estructural ya que no se resquebrajan. Dentro de la invención se contempla una capa comestible grasa la cual esta compuesta de grasa y otros sólidos comestibles tales como azúcares.

En el documento D3 se presentan composiciones a base de grasa que se utilizan como recubrimientos en repostería, rellenos de galletas. Usualmente se mezclan con sustancias saborizantes o azúcar. En la invención que presenta este documento se considera una composición de ácidos grasos de al menos 88% C10-C18 incluyendo no más de 25% de ácido esteárico. preferiblemente el contenido en ácido esteárico se encuentra al menos en un 15 % en peso. Las mezclas preferidas tienen un valor de yodo al menos de 12.

Como se puede apreciar en los documentos presentados los elementos que contiene la solicitud tales como la galleta, la barrera comestible a base de ácidos grasos y azúcar son conocidos en las anterioridades, por lo tanto el producto de la presente solicitud es derivable del estado de la técnica. En cuanto al procedimiento este no se encuentra definido de una manera adecuada como para diferenciarlo de cualquier proceso convencional de recubrimiento para galletas.

Por lo tanto la solicitud no cumple con lo establecido en el artículo 18 de la Decisión 486.

En conclusión los requisitos de patentabilidad de la presente solicitud se encuentran afectados así:

| N° | DOCUMENTO    | REIVINDICACIONES AFECTADAS | REQUISITO QUE AFECTA |
|----|--------------|----------------------------|----------------------|
| D1 | US 5,340,598 | 1 a 11                     | NIVEL INVENTIVO      |
| D2 | US 4,820,533 | 1 a 11                     | NIVEL INVENTIVO      |
| D3 | US 4,214,012 | 1 a 11                     | NIVEL INVENTIVO      |

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 la 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 CÉSPEDES DE VERGEL**  
 Jefe de la División de Nuevas Creaciones.

El anterior requerimiento fue notificado por fijación en lista, de fecha 19/02/2007

|                                                     |                                                             |
|-----------------------------------------------------|-------------------------------------------------------------|
| <b>CONCEPTO TÉCNICO</b><br><b>N°</b><br><b>0600</b> | <b>EXAMINADOR TÉCNICO</b><br><b>CÓDIGO</b><br><b>202064</b> |
|-----------------------------------------------------|-------------------------------------------------------------|

[54] METHOD FOR PRODUCING SPHERICAL  
SHAPE BAKED GOODS

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[21] Appl. No.: 137,528

[22] Filed: Oct. 15, 1993

[51] Int. Cl.<sup>5</sup> ..... A21D 8/00

[52] U.S. Cl. .... 426/496; 426/467;  
426/503; 426/523

[58] Field of Search ..... 426/496, 503, 518, 523,  
426/467, 306; 99/474, 477; 126/21 A

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| 4,381,697 | 5/1983  | Crothers        | 99/443 C |
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Primary Examiner—George Yeung

[57] ABSTRACT

Spherical baked goods, such as, cookies, crackers and  
snacks, are produced on a mass production basis by  
feeding a farinaceous dough or other food composition  
to one or a plurality of dies which shape it into ropes.  
The shaped extrudate ropes obtained from each die are  
cut by a cutting means, such as, a reciprocating cutter,  
which severs and shapes the rope into substantially  
spherical, cylindrical or rounded pieces. The doughs  
which are cut into substantially spherical, cylindrical or  
rounded pieces can be raw, partially cooked or baked,  
or fully cooked. A spherical or rounded shape is main-  
tained or obtained upon subsequent baking or leavening  
of the substantially spherical dough pieces by contin-  
uously moving them relative to the oven conveyor so as  
to avoid flattening of the dough piece due to spreading.  
The baked pieces are sufficiently rounded or spherical  
so as to permit continuous application of confectionary  
coatings of substantially uniform thickness by pan coat-  
ing techniques.

13 Claims, No Drawings

# METHOD FOR PRODUCING SPHERICAL SHAPED BAKED GOODS

## FIELD OF THE INVENTION

The invention relates to the production of coated, spherical baked goods, such as, cookies, crackers and snacks.

## BACKGROUND OF THE INVENTION

In some commercial schemes, fermented dough is dropped into a divider hopper, which cuts the dough into loaf-sized pieces. The dough is then forced into pockets of a divider having a known volume. The pocket contents are cut off from the main dough mass. The dough pieces of constant volume are ejected onto a conveyor leading to a rounder. The dough pieces leaving the divider are irregular in shape with sticky cut surfaces from which the gas can readily diffuse. The rounder closes the cut surface, giving each dough piece a smooth and dry exterior. A relatively thick and continuous skin is formed around the dough piece. The rounder shapes the dough into a ball for easier handling in subsequent steps. The rounder performs its functions by rolling the floured dough pieces around the surface of a drum or cone, moving it upward or downward along this surface by means of a spiral track. As a result of this action, the surface of the dough pieces is dried both by the even distribution of dusting flour and by dehydration resulting from exposure to air. The dough pieces assume an approximately spherical shape. After being allowed to rest, the dough pieces are conveyed to a molder. See *Matz, Samuel A.*, "Cereal Technology", (1970), pages 56 to 59; and *The New Encyclopedia Britannica*, Macropædia, Volume 2, (1974), page 601.

Rounders can be classified as bowl-, drum-, or umbrella-type. The conical or bowl variety consists of a rotatable cone-shaped bowl around the interior of which is placed a stationary spiral track or race. From the conveyor leading from the divider the dough pieces fall into the feed hopper of the rounder and then drop to the bottom of the rotating bowl. The pieces are tumbled and rolled along the dough race until they emerge from the top of the bowl and fall onto the belt leading to the intermediate proofer. A second type of rounder is the so-called umbrella or inverted cone variety. These machines differ from the preceding type in that the dough piece is carried along the outside surface of a cone which has its apex facing upward. The third type of rounder is the drum rounder. This machine differs from the bowl and umbrella styles in that the cone segment has very little slope to its sides, i.e., the sides are almost vertical. The dough piece enters near the bottom of the drum and rolls upward. In addition to their form, rounding machines may vary in the texture or composition of the rotating surface, in the means provided for adjusting the relationship of the dough race to the drum or cone, in the method of applying dusting flour, etc. The rotating surface is usually corrugated vertically or horizontally, but the design and the size of the ribs vary considerably from one manufacturer to another. The surface may be waxed or it may be coated with a plastic such as Teflon to reduce sticking.

U.S. Pat. No. 3,110,610 discloses a dough piece rounder for shaping dough pieces. A mass of dough is made into uniform pieces of equal weight. The dough pieces are deposited onto an endless air impervious flexible belt. The belt conveys the pieces to a dough

shaping apparatus. The dough pieces are shaped into a desired shape. The belt is supported and cooled by a perforated plate deck lying just underneath at least a portion of the belt. Air is discharged from the perforated plate deck to provide a film of air between the plate deck and the belt to reduce the friction therebetween and to carry away heat from any friction heat generated. The dough pieces can be formed into spherical shapes by the apparatus of the patent.

U.S. Pat. No. 3,147,669 discloses edible articles for ingestion. The edible articles comprise an edible cookie bit defined by a mixture of flour, sugar and shortening baked into a predetermined size and into a predetermined shape. The surface of the cookie bit has a characteristic for absorbing an edible foodstuff into at least a portion of the surface while retaining the predetermined shape. The predetermined structural characteristic of the cookie bit is defined by the ability of the edible cookie bit for absorbing the foodstuff and retaining the structural integrity of the edible cookie bit. The edible foodstuff for coating the surface without compromising the predetermined shape, covers the edible cookie bit so that the surface is not visible in the finished edible article. The cookie bits have a count per pound of about 300 to about 3000.

U.S. Pat. No. 2,219,329 discloses using a fluidized bed to treat food materials. The patent discloses roasting discrete materials, such as, rice, wheat, corn flakes and potato chips, utilizing a fluidized bed to obtain a bubble surface.

U.S. Pat. No. 3,149,976 discloses using a fluidized bed to treat food materials. The patent discloses roasting granular organic material, such as, coffee beans, cocoa beans, peanuts and cereals, by controlled fluidization.

U.S. Pat. No. 4,623,545 discloses using a fluidized bed to treat food materials. The patent discloses receiving pieces of dough divided from a dough mass, sheeting the dough, passing the dough pieces over a fluidized bed while squeezing the pieces between a pair of rollers.

U.S. Pat. No. 4,666,726 discloses using a fluidized bed to treat food materials. The patent discloses a dough molding method wherein a piece of dough is caused to pass over a fluidized bed in its approach to a pair of sheeting rolls.

U.S. Pat. No. 4,276,978 discloses reshaping a cylindrical dough into a roundish shape and coating it, using a revolving drum to reshape the dough.

U.S. Pat. No. 4,349,574 relates to the shaping of cookie dough into conical pieces using a die roll. The conical pieces are laid on their side and baked on a conveyor in an oven so that all baked surfaces are rounded. Panning and handling are facilitated by the shape. Cylindrical or frustroconical shapes can also be used. However, according to the patent spherical cake or cookie products are inherently difficult to make.

U.S. Pat. Nos. 4,381,697 and 4,397,881 are similar to U.S. Pat. No. 4,349,574. U.S. Pat. No. 4,381,697 discloses using a die roll to produce cone-shaped cookie dough bits which are transferred by conveyors to an oven conveyor for baking to form cookies. U.S. Pat. No. 4,397,881 discloses using a die roll to shape cookie dough into a part cylindrical, part conical configuration. Spherical cake or cookie products, it is disclosed, are inherently difficult to make. The shaped dough pieces are baked on an oven conveyor.

U.S. Pat. No. 4,293,572 relates to the coating of baked or fried products. The patent discloses coating baked or

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fried products with a moisture barrier by dipping, spraying, brushing or a water fall.

U.S. Pat. No. 4,976,978 discloses a method of reshaping deformable food material, such as dough, by rolling said pieces in the presence of particulate coating material in a revolving drum, thereby reshaping the pieces into roundish, coated bodies.

The following patents relate to the use of heated streams in a baking chamber. However, fluidization of dough pieces to reshape and leaven them into roundish pieces is not taught in them:

U.S. Pat. No. 3,984,578 discloses baking food in a closed space in which heated air is circulated. The temperature is varied in a saw-tooth fashion to minimize soiling of the cooking space.

U.S. Pat. No. 4,462,383 discloses baking bread, cookies, etc., in which high velocity, heated air is impinged against the food product.

U.S. Pat. 4,587,946 discloses baking food in an oven while circulating heated air with a fan to obtain substantially uniform baking throughout the oven.

U.S. Pat. No. 4,679,542 discloses cooking food by conveying the same through an oven while heated air is forced through the oven and impinges the food.

U.S. Pat. No. 4,865,864 discloses an air heated oven wherein food pieces are placed in a perforated basket and heated air flows through the basket and heats the food pieces.

U.S. Pat. No. 4,963,375 discloses cooking foods in an oven while controlling the air flow rate in the oven.

British Patent No. 462,897 discloses regenerating bakery products by subjecting the products to the action of freely circulating heated air.

German Patent No. 2,446,581 discloses a baking process which utilizes a moving stream of hot air.

French Patent No. 2,409,006 discloses a baking chamber utilizing circulating air.

The present invention provides a process for continuously mass producing spherical baked goods while avoiding flattening of the dough pieces due to oven spreading. The leavened products are sufficiently spherical so as to enable continuous application of uniform confectionery coatings by pan coating without sticking of the pieces to each other during coating.

### SUMMARY OF THE INVENTION

An object of the invention is to provide a method for the production of coated, spherical baked goods, such as, cookies, crackers and snacks on a mass production basis. The baked goods may be elliptical in cross section, egg-shaped or jelly bean shaped, or have other rounded shapes which are essentially absent of flat portions formed by contacting a heated flat surface during baking.

The objects and advantages of the invention are achieved by the process of the invention.

Some embodiments of the invention deal with a baking process where a dough forming device is used for shaping dough in a cylinder with the girth approximately equal to the length. The formed dough pieces are conveyed into a fluidized hot air stream, for example, where they are baked for a specific length of time yielding a spherical/ellipsoidal finished sweet good product. A channeled pan (shaker pan) having a cam with a back and forth motion to the direction of travel is used to help keep the pieces moving in relative motion to their forward (conveyor) motion through the

baking unit. This is exemplary of the broader process and features of the invention method.

The invention involves a method for the production of spherical baked goods. The method involves: (a) feeding a firmaceous based dough through at least one die to obtain at least one cylindrically shaped extrudate dough rope; (b) cutting each of the cylindrically shaped extrudate ropes to obtain substantially spherical dough pieces; (c) conveying the substantially spherical dough pieces through an oven by means of a conveyor while moving the substantially spherical dough pieces relative to the conveyor so as to promote the production of spherical dough pieces; and (d) heating the spherical dough pieces while moving the spherical dough pieces relative to the conveyor to leaven the spherical dough pieces into spherical baked goods.

Optionally the spherical baked goods can be coated with an edible composition.

The invention provides a method for the mass production of baked products, such as cookies, crackers, and snacks from dough pieces which when baked retain or form a baked product having a substantially spherical or rounded shape so as to enable it to be substantially uniformly and continuously pan coated with a confectionery coating. The round coated products may be produced using one or more multi-orifice extruders to increase production rates, reciprocating cutters to form cylindrical or rounded dough pieces, and a fluidized bed baking oven to bake the dough pieces into a round or spherical shape.

The invention provides for the production of rounded or spherical baked goods such as cookies, crackers, and snacks, which are pan coated with a confectionery coating on a mass production basis. A firmaceous-based dough is fed to one, or preferably a plurality of dies which shape the dough composition into at least one shape conforming to the orifices of the dies. The shaped extrudate rope obtained from each die is cut by a blade, wire or the like to provide substantially spherical or cylindrical dough pieces.

The substantially spherical dough pieces are conveyed through an oven by means of a conveyor while moving the substantially spherical dough pieces relative to the conveyor so as to promote the production of spherical dough pieces. The spherical dough pieces are heated while moving the spherical dough pieces relative to the conveyor to leaven the spherical dough pieces into spherical baked goods.

The use of a multi-port extrusion die permits higher mass flow rates and thus greater dough piece production rates at lower cutter speeds. The use of lower cutter speeds increases accuracy of cutting. The larger the number of die orifices at a given production rate, the slower is the rate of flow through each orifice. Deformation of the individual pieces is also reduced by decreasing the speed at which they impact equipment parts upon being cut. In addition, the use of multiple orifices permits the use of lower pressure for a given production rate which positively impacts the texture of the final product. The plurality of dies can be fed by a calendar press or preferably an extruder, most preferably an extruder with a plurality of conveying screws.

The doughs which pass through the dies for cutting into spherical pieces can be raw, partially cooked or baked, or fully cooked or baked or expanded. The raw doughs, partially cooked doughs, or glossy half-products can be heated subsequent to cutting into spherical or rounded shapes by continuously preventing the

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pieces from obtaining a flattened bottom during transport to a baking oven and during baking. This can be accomplished by means of vibratory conveyers and a fluidized bed heater. Fully cooked or baked doughs can be cut and shaped into rounded or spherical pieces while still in a plastic state.

In embodiments of the invention, the extrudate dough rope can be cut just prior to or during substantial expansion or puffing of the dough, such as, in the production of snacks. In the production of cookie and cracker-type products, for example, the dough is preferably cut prior to any substantial expansion. The cut, essentially raw dough can then be transferred by a conveyor belt to an oven for baking and leavening into spherical or rounded baked goods.

Conventional snack, half-product, cracker and cookie compositions may be used in producing the spherical or rounded food products of the present invention. However, in the production of the spherical products, such as cookies, gluten is preferably included in the cookie dough to promote and retain a spherical shape during machining and baking. Also, in the production of spherical crackers, the amount of water and an enzyme composition comprising one or more proteolytic enzymes are preferably used to: (a) increase the expandability or leavening ability of cracker doughs and (b) reduce cracker hardness which can result upon baking cracker doughs which have undergone high extrusion pressures.

High extrusion pressures tend to change the air cells in a dough. Generally the greater the pressure the lesser the degree of expansion upon subsequent baking and the harder the texture of the cracker. It has been found that cracker doughs having: (1) a water content of from about 15 percent to about 35 percent by weight, preferably from about 17 to about 21 percent by weight, most preferably from about 18 to about 20 percent by weight, of the dough, and (2) from about 9 to about 20 grams, preferably from about 11 to about 17 grams, of proteolytic enzymes per 100 pounds of the flour are extrudable doughs which retain their shape during transport to baking ovens and are bakeable into a tender cracker.

The use of an emulsifier, such as, sodium stearyl lactylate, and a chemical leavening agent, such as, ammonium bicarbonate, also promotes a tender texture in the spherical crackers or cracker-like products of the invention.

#### DETAILED DESCRIPTION OF THE INVENTION

The present invention provides a process for making cookies having a substantially spherical, or egg or jelly bean shape by extruding a cookie dough in the form of a strand or rope, cutting the dough to a desired shape, baking the dough in a fluidized bed to leaven it wherein the dough assumes and retains an oval or rounded shape, and optionally coating the baked product. Spherical crackers and snacks may also be produced in the process of the present invention.

The apparatus preferably comprises an extruder which feeds a dough through an optional elbow to a die head or die plate which is located at the bottom end of the optional elbow. In the production of crackers, the extruder may be a modified pretzel extruder containing one or more sets of individual, non-intermeshing screws for feeding dough through the elbow to the die head. A hopper is used to feed the dough to the extruder screws.

In embodiments of the invention, the cookie dough, cracker dough or other dough may be fed to the die head or die plate by means of a continuous mixer, or counter-rotating rolls, such as those of a calendar press, instead of by an extruder. An extruder is the preferred means for feeding the dough through the dies.

The dough can be produced in at least one mixing apparatus such as a batch mixer, continuous mixer, or extruder, and then transferred to the forming or shaping extruder via the hopper. In other embodiments of the invention, the dough ingredients can be added to and mixed to form a dough within an extruder or continuous mixer having a plurality of dies which are in association with the reciprocating cutting means.

In the production of partially cooked products, half-products, or fully expanded products such as snacks, a cooker extruder is preferably used to cook and feed the food composition to the die head.

Known convection ovens, band ovens, microwave ovens, radio frequency ovens, fryers or oil baths, fluidized bed heaters, jet zone ovens or combinations thereof, such as, a serially arranged microwave oven and a jet zone oven, can be used in the invention. These devices can be used, for example, to bake raw or partially cooked doughs which have been cut into spherical or rounded shapes. Spherical half products can, for example, be puffed or expanded by means of a microwave oven, jet zone oven, fryer or combinations thereof.

#### Formulations And Processing

Conventional formulations and extruder processing conditions can be used in the production of spherical or rounded crackers, cookies, expandable or puffable glassy matrix half-products, snacks and biscuits. However, it is preferable to include gluten, such as vital wheat gluten in the formulations in amounts which promote the formation and retention of a spherical or rounded shape in the dough piece during cutting of the dough into pieces, during transport of the pieces and during baking of the pieces. Exemplary amounts of added gluten range up to about 10% by weight, preferably from about 2% to about 7% by weight, based upon the weight of the flour.

The flour component can be any comminuted cereal grain or edible seed meal, derivatives thereof and mixtures thereof. Exemplary of the flour components which can be used are wheat flour, corn flour, oat flour, barley flour, rye flour, rice flour, potato flour, grain sorghum flour, corn starch, physically and/or chemically modified flours or starches, such as, pregelatinized starches, and mixtures thereof. The flour can be bleached or unbleached. Wheat flour or mixtures of wheat flour with other grain flours are preferred. The amount of flour used in the cookie compositions of the invention ranges, for example, from about 30 to about 70 percent by weight, preferably from about 45 to about 55 percent by weight. Unless otherwise indicated, all weight percentages are based upon the total weight of all ingredients forming the doughs or formulations of the invention except for inclusions such as flavor chips, nuts, raisins and the like. Thus, "the weight of the dough" does not include the weight of inclusions.

The flour can be replaced in whole or in part by flour substitutes or bulking agents, such as, polydextrose, hydrocellulose, microcrystalline cellulose, mixtures thereof, and the like. Corn bran, wheat bran, oat bran, rice bran, mixtures thereof, and the like, can also be

[54] **EDIBLE BARRIER FOR COMPOSITE FOOD ARTICLES**

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[73] Assignee: General Mills, Inc., Minneapolis, Minn.

[\*] Notice: The portion of the term of this patent subsequent to Apr. 28, 2004 has been disclaimed.

[21] Appl. No.: 117,408

[22] Filed: Nov. 2, 1987

**Related U.S. Application Data**

[63] Continuation of Ser. No. 803,358, Dec. 2, 1985, abandoned, which is a continuation of Ser. No. 740,797, Jun. 3, 1985, Pat. No. 4,661,359, and a continuation-in-part of Ser. No. 788,178, Oct. 16, 1985, Pat. No. 4,710,228.

[51] Int. Cl.<sup>4</sup> ..... A21D 15/08; A23C 19/14; A23G 3/00; B65D 25/08

[52] U.S. Cl. .... 426/76; 426/89; 426/90; 426/92; 426/93; 426/94; 426/103; 426/106

[58] Field of Search ..... 426/93, 94, 95, 76, 426/112, 100, 101, 113, 106, 90, 91, 138, 120, 86, 234, 107, 390, 391, 115, 114, 243, 241, 139, 103, 89, 272, 273, 274, 275, 279, 282, 392, 393, 810, 811, 415; 106/200, 218, 219; 427/2, 372.2; 424/33, 34, 92, 103, 101, 102; 260/97; 527/600, 602, 604, 601

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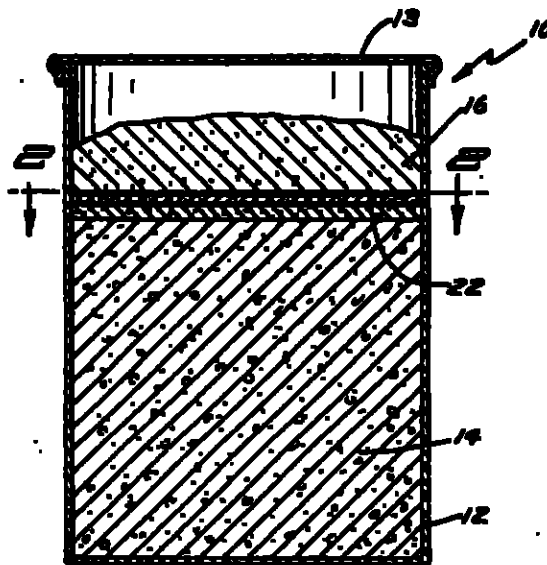
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Primary Examiner—Steven Weinstein  
Attorney, Agent, or Firm—John A. O'Toole

[57] **ABSTRACT**

Disclosed are edible barriers useful in composite food articles to separate one food phase from another which differ in such properties as water activity, protein concentration, etc. The edible barriers are especially useful in wrapped or packaged food items. The edible barriers comprise an edible laminate which includes an edible support substrate and top and bottom layers of an edible film coating of low moisture permeability.

17 Claims, 4 Drawing Sheets



## EDIBLE BARRIER FOR COMPOSITE FOOD ARTICLES

This is a continuation of U.S. patent application Ser. No. 803,358, filed Dec. 2, 1985, abandoned, entitled Edible Barrier For Composite Food Articles which is a continuation in part application of U.S. Ser. No. 740,797 entitled Edible Coating Compositions Comprising Acid Catalyzed Shellac and Hydroxypropyl Cellulose and Methods of Preparation (filed June 3, 1985), now U.S. Pat. No. 4,661,359 and a continuation in part application of U.S. Ser. No. 788,178 entitled Edible Coating Composition and Method of Preparation (filed Oct. 16, 1985), now U.S. Pat. No. 4,710,228.

### BACKGROUND OF THE INVENTION

#### 1. Technical Field

The present invention relates to food products. In particular, the present invention relates to an edible barrier component useful in packaged or wrapped food products.

#### 2. The Prior Art

At present, at least two significant consumer trends influence consumer preference for food products. Consumers increasingly are eating more either away from home or even if at home, away from traditional, sit down full course dinners. Rather, consumers are eating more and more "on the run" whether at home, in work or pleasure activities. The second trend is for consumer preference for food products perceived as being more nutritious than conventional snack items.

Due to these two trends, one particular type of food product enjoying greatly increased consumer popularity is yogurt. Recently, certain styles of yogurt containing partially puffed cereal grains and fruit mixed throughout the yogurt have also been popular. Such products provide relatively crunchy or chewy materials dispersed in a smooth or creamy medium. While popular, such products require specially prepared cereal grains and a fruit in order for the grain and fruit products to maintain their desirable texture while in intimate admixture with the moisture containing yogurt.

Notwithstanding the advantages that such products enjoy over competitive products, it would be desirable to be able to provide products containing two even more widely dissimilar components as a convenience item. Such products, for example, could include yogurt or pudding with ready-to-eat cereal, soup with crackers, cake and ice cream. However, due to the difference in the properties between the two components, physical contact therebetween for extended periods of time result in migration or penetration problems leading to the degradation of the desirable properties of each ingredient.

Among the various potential gradients in such composite food articles, moisture migration remains the most significant problem area. While throughout the remainder of the specification below, particular attention is addressed to the problems of moisture migration and moisture penetration of coating or barrier compositions, the skilled artisan will appreciate that the present invention also finds usefulness in the problems associated with additional migration or penetration problems including oxygen, acidity, color, oil and protein.

The prior art, of course, includes numerous examples of inedible barriers in the form of laminates having moisture impermeable coating (see, for example, U.S.

Pat. No. 3,170,568 issued Feb. 23, 1965 to P. H. Carter). Also known are edible containers having an inedible internal moisture barrier (see, U.S. Pat. No. 4,472,440 issued Sept. 18, 1984 to H. M. Bank). U.S. Pat. No. 4,390,553 (issued June 28, 1983 to Rubenstein et al.) discloses an edible food container with a fat coating of its inner surface.

The prior art has included a number of packaging developments to provide two compartment packages to separate dissimilar components until admixture immediately prior to consumption. In particular, U.S. Pat. No. 4,233,325 issued Nov. 11, 1980 to Slangen et al.) disclosed an ice cream package including a compartment for heating syrup. However, the barrier between the syrup and the ice cream is not edible. Thus, the package compartment housing the syrup must be removed entirely and the syrup poured onto the ice cream in the lower compartment. It is possible to make the supporting member of the compartment pierceable or tearable allowing for penetration thereof by, for example, a spoon, the contents of the upper container could then be allowed to fall or drain into the lower compartment. However, such construction suffers from several disadvantages. First, there is a trade-off between support strength of the barrier and the pierceability of the barrier. Second, for barriers which are more readily pierceable, fragments of the barrier material can be intermixed with the food. Not only is such admixture aesthetically unpleasant but consumption of the pieces of ruptured membrane material could possibly result in serious health problems.

Another two compartment package with an edible barrier to separate dissimilar components is disclosed in U.S. Pat. No. 2,714,070 (issued July 26, 1955 to A. E. Welch) where an ice cream cake or cone body is used to separate an upper sauce component from a lower ice cream component in a microwavable cup. However, such barriers have been found ineffective to prevent moisture migration between the two components over extended storage times even though simple physical separation of the components may be achieved. Also, the ice cream cone material loses its desirable crispness over time due to the moisture migration.

Another edible barrier is disclosed in U.S. Pat. No. 2,600,566 (issued June 17, 1952 to F. W. Moffett) which affords a frozen food package, such as an ice cream package whereby a body of ice cream or frozen dessert and a body of topping or syrup adapted to be liquified upon heating is separated by an edible or other insulating barrier or layer as for instance, a cake-like layer positioned between the ice cream and body of topping material. The cake-like layer acts to keep the syrup or topping hot. Unfortunately, such cake-like barriers, while edible, provide little resistance to moisture migration between the two food components. Thus, at best, such known barriers can be used only with products wherein the components differ only slightly with regard to such important features as water activity or could only be used for frozen foods. Additionally, the cake-like layer provides only modest support strength. Thus, the cake-like barrier could not be used with regard to two-component food products, the major weight fraction of which is a moist food, e.g., yogurt and a minor portion of which is composed of individual pieces of dry, fragile particulate material, e.g., ready-to-eat whole wheat flakes.

Still another problem can exist with edible barriers. If the barriers are fabricated from materials of sufficient

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strength or rigidity to support heavy amounts of product or which resist breaking or disruption upon ordinary handling, then the barriers may be difficult to pierce when desired or can be broken up into bite sized pieces only with great difficulty.

Accordingly, it is an object of the present invention to provide edible barriers for composite food items.

It is a further object of the present invention to provide edible barriers with enhanced structural support.

Another object of the present invention is to provide edible barriers of enhanced structural support which are resistant to moisture migration.

Still another object of the present invention is to provide strong edible barriers resistant to moisture penetration but which nonetheless are easily breakable by the consumer into bite sized pieces in preparation for consumption of the article.

Another object of the present invention is to provide edible barriers which maintain crispness over extended storage times even when used to segregate high moisture food materials.

A further object of the present invention is to provide composite food articles having two or more phases of different food materials separated with edible barriers which are effective to prevent migration between the different food materials.

It has been surprisingly discovered that the above objectives can be realized and superior edible barriers for composite food products obtained by providing an edible laminate comprising a support substrate being sandwiched between layers of edible films of high moisture impermeability.

### SUMMARY OF THE INVENTION

The present invention provides an edible laminated barrier useful in composite food articles to separate food phases differing in properties such as water activity, protein concentration, color and the like. The barriers are highly resistant to moisture migration between the food phases and to degradation by moisture and/or oil, or swelling. The barriers also provide good structural support while nonetheless are readily breakable. The barriers comprise (A) a first layer of an edible support substrate in the form of a sheet or planar form. The substrate can be a cookie, biscuit, wafer or compressed cereal bar, chocolate, compressed nuts, compound chocolates or fat systems. The barrier further essentially comprises (B) a layer of an edible, low-water permeable film overlaying the substrate. The barriers also include (C) a layer of an edible, low-water permeable film underlying the substrate.

The edible water impermeable films comprise shellac based coating resins such as are more fully described below. The overlaying and underlying layers can each range in thickness from about 1 to 5 mils.

The present invention further provides composite food articles comprising a plurality of food materials with an edible barrier separating the food materials and which provides superior resistance to migration between the food materials.

### BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a cut away side elevational view of a food package dividing into two compartments by the edible barrier of the present invention and separating a first food from a second food;

FIG. 2 is a top sectional view taken along lines 2—2 of FIG. 1 showing one embodiment of the present edible laminated barrier;

FIG. 3 is an exploded, greatly enlarged cross-sectional view of the laminated, edible barrier taken along lines 3—3 of FIG. 2;

FIG. 4 is a top plan view of another embodiment of a laminated, edible barrier of designed breakability;

FIG. 5 is an enlarged cross sectional view of the edible barrier taken along lines 5—5 of FIG. 4;

FIG. 6 is a top plan view of another embodiment of an edible barrier substrate designed to provide enhanced structural strength;

FIG. 7 is a cross sectional view of an edible barrier of enhanced structural strength taken along lines 7—7 of FIG. 6;

FIG. 8 is a cross sectional view similar to that of FIG. 5 of a second embodiment of an edible barrier substrate of designed breakability;

FIG. 9 is a cross sectional view similar to that of FIG. 7 of a third embodiment of an edible barrier substrate of designed breakability;

FIG. 10 is a table presenting analytical tabulated data on the performance of an edible barrier of the present invention in performance testing; and

FIG. 11 is a table presenting qualitative tabulated data on the performance of an edible barrier of the present invention in performance testing.

### DESCRIPTION OF THE PREFERRED EMBODIMENTS

In one aspect, the present invention relates to edible barriers of superior moisture impermeability useful in packaged composite food articles to separate food phases which differ in water activity, soluble color concentration, acidity, oil concentration and the like. The edible barriers are laminated in construction and comprise a support substrate with over- and underlying coatings of an edible, low-moisture permeability film. Each of these product elements as well as their composition and method of preparation are described in detail below. In another aspect, the present invention provides composite food articles comprising two or more food materials separated by the present edible barriers.

Throughout the specification and claims, percentages and ratios are by weight, and degrees in Fahrenheit, unless otherwise indicated.

Referring now to the drawings, and to FIG. 1 in particular, there is shown an embodiment of the present packaged composite food article which is designated generally by reference numeral 10. As can be seen, the packaged composite food article 10 includes a conventional container or cup 12 which can be an inedible material, plastic, coated paper, and the like or can be fabricated from an edible material, e.g., ice cream cone a.k.a. sugar wafer. The article further includes a conventional top seal closure or lid 13. The article 10 further includes a first or lower food phase or portion 14. The first food region may be any manner of dry or wet food, e.g., yogurt, soup, ice cream or cake whether frozen or liquid. Typically, the lower food portion should be the higher weight fraction of the total food, or the more dense food phase so as to give the article 10 stability from tipping over.

The article 10 further includes an upper or second food portion or phase 16 which differs from the lower food phase 14 in some compositional aspect such as acidity, water activity, or soluble color, protein, oil,

and/or oxygen concentration. By virtue of such differences, a gradient would be established were the food phases not effectively sealed against each other which gradient would lead to migration between the two portions or to reaction between components thereof, e.g., Maillard reactions, causing undesirable browning.

The article 10 additionally includes an edible barrier 20 of the present invention. As can be seen, the barrier rests upon the upper surface 22 of the lower food phase 14 and can even be in physical contact therewith.

Referring now briefly to FIG. 2, it can be seen that the edible barrier 20 can be generally circular in construction substantially completely filling the inner diameter of the cup 12. Of course, other shaped containers can also be employed, e.g., square, rectangular, etc. In such embodiments, the present edible barrier 20 is shaped to conform to such alternate cup designs.

Reference is now made to FIG. 3 which depicts the laminate construction of the present edible barriers 20. The barrier 20 generally include a support of substrate 22. Typically, the substrate 22 is generally planar or is sheet-like in form. The substrate can be formed of any edible material providing models structural support and coherency to support the upper food layer (not shown) and providing a smooth surface. Exemplary materials useful herein include cookies providing such cookies have a smooth, hard surface. The desirability to have a smooth surface as opposed to an open cell or rough surface, e.g., cut layer cake surface, involves the support providing a surface sufficiently smooth to provide a surface to which an even, break-free film or sealant layer (described below) can be applied.

The art is replete with suitable food products having the here described physical features and the skilled artisan will have no difficulty in formulating and fabricating edible substrates suitable for use herein. Among the many substrates useful herein for the substrate 22 are, for example, baked sugar wafers such as used in conventional ice cream cones (see, for example, U.S. Pat. No. 1,876,103, issued Sept. 6, 1932 to W. W. Turnbull and U.S. Pat. No. 1,498,464, issued June 17, 1924 to L. A. Marinelli). Also useful herein for the substrate are bars prepared from compressed cereal fines or nut pieces or powder. Such bars are prepared by merely compressing (e.g., 10-30,000 psi) (730-2200 Kg cm<sup>-2</sup>) particulates with or without excipients or pelletizing agent, e.g., tableting sugars, marketed under the trade name CANTAB by Penick and Ford Limited, Cedar Rapids, Iowa or other fillers and/or magnesium stearates, fats and/or oils and other binding glident and lubricant agents. Both heat tolerant and heat sensitive materials can be employed herein in preparing the substrates or supports. The supports typically are lower in moisture content, e.g., less than 10%, typical of wafers, crackers or biscuits. Other useful support materials include chocolate, cheese, crystalline sugars, peanut brittle, thin candy bars and compounded coatings. Highly preferred materials either remain crunchy or tend to soften slightly upon aging. Less desirable materials like sugar wafers or baked wafers tend to toughen upon aging and become leathery.

Still referring to FIG. 3, it can be seen that the edible barriers 20 additionally essentially comprise an upper or overlying layer 22 and further essentially comprise a lower or underlying layer 24 each of an edible film material of low moisture permeability. It is important that the film material provide continuous, flexible, moisture impermeable, non-water swelling films. Any edible

food film composition providing the above attributes can be used herein, e.g., conventional shellac. Especially suitable compositions, composition preparation and application techniques for use as the film layers are disclosed in U.S. Pat. No. 4,661,399, issued Apr. 28, 1982 by Seaborne et al. entitled EDIBLE COATING COMPOSITIONS COMPRISING ACID CATALYZED SHELLAC AND HYDROXYPROPYL CELLULOSE AND METHOD OF PREPARATION, and U.S. Ser. No. 788,178 filed Oct. 16, 1985, now U.S. Pat. No. 4,710,228, by Seaborne et al. entitled EDIBLE COATING COMPOSITION AND METHOD OF PREPARATION, each of which are incorporated herein by reference. Generally, these coating compositions are polymers of a specially defined, heat cured shellac or copolymers of the shellac with certain other reactants have a reactive acid or hydroxyl moiety. These materials are further described below. Generally, each film layer herein can range from about 0.1 to 5 mil in thickness, preferably 0.5 to 2.0 mil. The films 22 and 24 can be compositionally similar or different so long as the films provide the requisite low moisture impermeability and other properties. Of course, multiple layers can also be used for additional protection.

While good sealant barriers can be prepared employing upper and lower films 24 and 26 as described above, in certain highly preferred embodiments, the edible barriers 20 additionally comprise an edible fat layer 27 in substitution or in addition to the film layer(s). The edible fat layer can be based upon any edible fat or fat based composition, e.g., compound fats which are mixtures of fat and other food solids, typically sugars. Useful, for example herein, are chocolate, whether sweet or semi-sweet, milk or dark chocolate, compound fat, or dairy fat based. Such confectionary coatings are well known in the food art and the skilled artisan will have no problem selecting compositions useful herein. The fat layer, however, is preferably substantially moisture free, i.e., butter and margarine, having moisture contents of about 20%, while useful, are less preferred. The fat layer provides modest additional moisture permeability protection as well as organoleptic improvements. As shown in the drawing, the fat layer is typically substantially thicker than the film layers. Suitable fat layers can range from 0.5 to 3.0 mm (0.019-0.12 inches) in thickness. While less preferred, embodiments of the present barriers can be prepared wherein the film intermediate the support and fat layer is eliminated. Thus, the fat layer while preferably used in combination with the film layers can in less preferred embodiments be used in substitution therefor.

The foregoing description of edible barriers of the present invention contemplates edible barriers which are relatively uniform in thickness although possible with modest mounding when cookies are employed. While useful, such barriers when broken during consumption can break into random and unpredictable size and shape and often break only with difficulty. Indeed, traditional wafer designs, e.g., for ice cream cones, frequently employ raised ribbing to give the wafer added structural support and/or to resist breaking.

Referring now to FIG. 4, there is shown a highly preferred, "designed fracture" substrate 28 embodiment. A designed fracture substrate includes means for fracturing the substrate into pieces of controlled shape and/or size. As shown the substrate 28 is in the form of a controlled disk or round sheet. The substrate is fabri-

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cated with a means for controlled fracturing of the substrate such as a plurality of radial grooves or score lines such as 30, 32 and 34. The substrate can also be formed with one or more concentric ring grooves such as 36. Construction of substrates with such grooves and/or score lines provide for controlled and easy fracturing of the disk shaped substrate 28 into wedge or other shaped pieces of roughly similar size and shape.

Referring now to FIG. 5, it can be seen that the grooves are relatively shallow. Preferably the grooves are in the top surface 38 of the substrate 28 so that the grooves are more discernable to the consumer so as to aid in the controlled fracture of the substrate 28. The grooves, of course, can be in the lower surface 40 as well, or on both surfaces.

Referring now to FIGS. 6 and 7, there is shown still another embodiment of the present substrate wherein a substrate 60 of enhanced structural strength is depicted. As can be seen, the top surface 61 of substrate 60 is provided with a series of vertically and horizontally extending ridges or ribs 62 and 64, respectively. As better seen in FIG. 7, the top layer of ribs 64 in the top surface 61 are offset relative to a series of ribs 66 formed into the bottom surface 68 of the substrate 60. This embodiment finds particular usefulness in supporting larger weights of an upper food material or when larger diameter cups are used.

Referring now briefly to FIGS. 8 and 9, there is shown alternate embodiments of grooves which can be cut into substrates. FIG. 8 shows a substrate 80 having a top surface 82 fabricated with a plurality of square cut shaped grooves 84. Referring now briefly to FIG. 9, there is shown an embodiment of a substrate 90 having a top surface 92 with "V" shaped grooves 94. Of course, the present invention can employ other groove designs and groove shapes.

These substrates as described above are useful herein for use in combination with upper and lower films as are described further below.

In the more highly preferred embodiments, the present coating compositions are prepared using thermoplastic resins essentially comprising the reaction product of shellac with or without a second reactant material having a reactive acid or hydroxyl moiety. As described in detail in the two patent applications referenced above, the second reactant can be an edible member having a reactive acid or hydroxyl moiety such as selected from the group consisting of hydroxypropyl cellulose (HPC), hydroxypropyl methyl cellulose, and mixtures thereof and/or an edible member having a reactive hydroxyl or acid moiety selected from the group consisting of edible sources of phenolics, edible sources of benzaldehyde and its derivatives, acetylated monoglycerides, polyglycerol esters, edible straight chain mono- and di-carboxylic acids and mixtures thereof. Preferred embodiments comprise copolymers of shellac with HPC and any of the edible straight chain mono- and di-carboxylic acids.

Shellac is an essential component of the present coating compositions. Shellac essentially comprises about 25% to 100% of the compositions. Better results in terms of both low moisture permeability and film flexibility are obtained when the shellac comprises about 30% to 99.9% of the composition. Best results are obtained when the shellac comprises about 58% to 99.9% of the coating composition.

Shellacs are commonly treated in various ways to modify its properties. Not all shellacs used in other food

applications can be used in this preferred embodiment. It is essential to use only dewaxed, filtered, carbon black decolorized, non-chemically modified or "virgin" shellac. It has been surprisingly found that other refined or bleached shellacs do not possess the reactivity required to cross-link so as to be useful in the present invention. Suitable shellacs are available from commercial suppliers such as Kane International, Larchmont, New York.

In the most highly preferred embodiments, hydroxypropyl cellulose or ("HPC") is the second principal essential component employed in forming the present coating compositions. A closely related material, hydroxypropyl methyl cellulose ("HPMC") can be used in full or partial replacement for HPC. As little as a 0.001:1 weight ratio of HPC has been found to be helpful in adding flexibility and moisture vapor permeability reduction to the shellac film and as much as a 2:1 ratio of HPC has been found to give good moisture vapor impermeability to the shellac film without losing the desirable sealing characteristics of the shellac film. Higher quantities of HPC can produce films which are more sensitive and moisture permeable. For better results, the HPC can comprise about 0.5 to 10% of the compositions.

HPC is a type of cellulose ether. The use of cellulose ethers in food coating compositions is well known. Cellulose ethers, by themselves, however, are generally considered to be unsuitable for coating in view of their brittleness or lack of resiliency, flexibility, and plasticity and, most importantly for some, water solubility. HPC and HPMC are highly water soluble and, undesirably, have a relatively high water permeability. A 2.00 mil film of pure hydroxypropyl cellulose will have a permeability of about  $8.73 \times 10^{-7} \text{ cm}^3 \text{ (STP) cm}^{-2} \text{ sec}^{-1} \text{ cmHg}^{-1}$  and hydroxypropyl methyl cellulose  $2.24 \times 10^{-4} \text{ cm}^3 \text{ (STP) cm}^{-2} \text{ sec}^{-1} \text{ cmHg}^{-1}$  cm. Plasticizers which have heretofore been employed in combination with the cellulose ethers are either of the non-edible type or, if edible, have detracted from the thermal stability and barrier properties of the cellulose ether. Additives are generally to be avoided for inclusion herein which have previously been suggested for cellulose ether coating compositions including glycerin, propylene glycol, polyoxyethylene compounds, glycerol monostearate acetylated monoglycerides of fatty acids or acylated fatty glycerides. Thus, preferred for use herein are those films which are substantially free (i.e., contain less than about 0.5% dry weight) of such materials.

The cellulose ethers employed in the coating composition of the present invention are edible cellulose ethers containing between 2.1 and 2.7 ether groups per glucose unit in the cellulose polymer chain. Published information suggests that the hydroxyl propyl substituent groups contain almost entirely secondary hydroxyls and that most of the primary hydroxyl in the cellulose have been substituted. It is the secondary hydroxyls that are the reactive groups remaining. Typical molecular weights for the hydroxyl propyl celluloses range from 60,000 to 1,000,000 and hydroxy propyl methyl celluloses 13,000-120,000.

While the precise phenomenon is not understood, the HPC or HPMC cannot be replaced with equivalent amounts of either methyl or ethyl cellulose. Such substitutions undesirably result in compositions forming films which are brittle and highly water vapor permeable. While not wishing to be bound to the proposed explanation, it is speculated that the hydroxy moieties of HPC

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[54] FAT COMPOSITIONS

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Related U.S. Application Data

[63] Continuation of Ser. No. 393,865, Sep. 4, 1973, abandoned, which is a continuation of Ser. No. 210,930, Dec. 21, 1971, abandoned.

[30] Foreign Application Priority Data

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[51] Int. Cl.<sup>3</sup> ..... A23C 15/12

[52] U.S. Cl. .... 426/607

[58] Field of Search ..... 426/607, 603; 260/410.7

[56]

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| 2,783,151 | 2/1957  | Cochran ..... | 426/607 |
| 3,396,037 | 8/1968  | Bell .....    | 426/607 |

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[57]

ABSTRACT

The specification describes a fat composition which is suitable for use as a confectioners' batter, particularly for biscuit cream fillings. The composition consists essentially of a random distribution of combined C<sub>10</sub>–C<sub>18</sub> fatty acids with a maximum stearic acid content and a specified iodine value range.

1 Claim, No Drawings

## FAT COMPOSITIONS

This is a continuation of application Ser. No. 393,863, filed Sept. 4, 1973, now abandoned; which is a continuation of Ser. No. 210,550, Dec. 21, 1971, now abandoned.

## BACKGROUND OF THE INVENTION

## 1. Field of the Invention

This invention relates to fat compositions which are particularly suitable for use as confectioners' butters and which are characterized by a randomized combined fatty acid composition conforming to specific requirements set out in more detail hereinafter.

The principal components of natural oils and fats are glycerides the fatty acids of which in combined form are found with different chain lengths and degrees of unsaturation. Different fatty acids may be found in the same glyceride molecule and in most natural fats a wide variety of glycerides is commonly found.

The nature of the fatty acids found in a fat and their distribution in the glycerides of which it is composed influences its melting characteristics and hence largely determines its suitability for edible purposes, in food products based essentially on fat compositions.

The melting requirements of a fat composition and therefore the nature of the fatty acids it contains vary according to the nature of the food product it is intended for and attempts to meet these requirements are based upon a judicious selection of fats, several of which may be blended to meet a particular purpose and by the further manipulation of its fatty acid content through fractionation and other, more sophisticated techniques the purpose of which is to concentrate those glycerides which are desired at the expense of those which are regarded as less desirable.

Although the melting characteristics of a fatty acid correspondingly affects those of a glyceride in which it is combined, with the result that a high melting fatty acid can form a high melting glyceride, the relationship is complicated in natural fats by the presence of a variety of fatty acids in several glyceride species and, combined within each glyceride molecule the possibility of more than one fatty acid. The melting point of fatty acid itself is influenced chiefly by its chain length and degree of unsaturation, naturally occurring unsaturated fatty acids being liquid at ambient temperatures, although it will be apparent that glycerides in which they occur may nevertheless be solid, owing to the greater influence of saturated, long chain fatty acids within the same glyceride molecule.

Although therefore some separation of combined fatty acids is effected by fractional crystallization of fats, it is incomplete because high and low melting fatty acids may be combined within the same glyceride molecule.

The melting behaviour of a fat composition may also be modified by redistributing its fatty acids among the glyceride molecules of the fat. The overall fatty acid composition remains unchanged but the redistribution, which may be on a random or statistical basis throughout the glyceride molecules, substantially modifies the melting behaviour of the composition. Techniques have been developed in which the interesterification is constrained to favour the continued formation of a specified glyceride by continuously withdrawing it from the reaction, for example by fractional crystallization. Reference may be made for further details of these tech-

niques to Bailey's Industrial Oil and Fat Products, 3rd Edition (Interscience 1964). It is not within the ambit of this specification to apply for protection of these fat manipulation techniques in themselves. The invention is concerned with the particular field of confectionery fat which are also known as confectioners' butters or hard butters. These have a wide variety of uses, being applied for example as candy coverings or as biscuit fillings, the fat usually being blended for such purposes with flavouring substances and sugar.

The melting requirements for confectioners' butters are apt to differ somewhat from those which are accepted for fats intended for use in chocolate compositions. For the specialized requirements of hard butters lauric fats are particularly prized. These include coconut oil, palm kernel oil and behen oil, although there are many others. This class of vegetable fats is so-called on account of their high content of lauric acid, usually in association with myristic acid, which are largely responsible for the desirable melting characteristics for which these fats are preferred.

Lauric fat are however expensive, and attempts have been made to incorporate other, less expensive fats, without rendering the resulting composition unacceptable for hard butter purposes. From the foregoing account however it will be apparent that the parameters governing the extent to which cheaper fats may be incorporated cannot be rationalized for practical purposes in terms of fatty acid composition alone and the art remains one of matching melting requirements with empirical recipes of natural, if modified fats.

## 2. The Prior Art

The use of interesterification as a method of modifying the melting behaviour of edible fats including lauric fats has been widely disclosed and may be exemplified by reference to U.S. Pat. Nos. 2,442,531 and 2,442,532 (Eckey). In British Pat. No. 953,788 (Canadian Packers) a confectionery coating fat is disclosed consisting essentially of hydrogenated palm kernel oil, part of which only is randomized. The preparation of hard butters based on mixed lauric and non-lauric fats is exemplified in British Pat. No. 1,102,944 (Nestle) in which a blend of short and long chain glycerides is disclosed as a chocolate fat melting at 22°-35° C. and having an iodine value falling within the range 30-35. The latter requirement is a measure of the extent of unsaturation and hence of the complement of unsaturated fatty acids, which contribute to the softness of the product and together with the kinds of fat components used to provide the long chain glycerides, renders the product less suitable for certain purposes as a confectionery fat.

The iodine values which may be calculated from the fat compositions disclosed in British Pat. No. 1,107,207 (National Biscuit Co.) all fall within a range which is too low for the purposes of defining the most suitable confectionery fat. This Patent describes fat compositions prepared by co-randomization of a saturated fat with a major proportion of a half-hydrogenated lauric fat.

A wide range of hard butter compositions is disclosed in U.S. Pat. No. 2,726,158 (Gildien) in which a fat formulation is described including rearranged blends of lauric and non-lauric fats which are then hydrogenated and conform to specified iodine value and fatty acid chain length ranges. All the Examples with which the disclosure is specifically exemplified however are based on fat compositions whose stearic content and iodine values are too high to afford the most suitable fat blends

for confectioners' butter. Similarly the fat compositions disclosed in U.S. Pat. No. 2,936,238 (Weiss) are based on co-randomised lauric and non-lauric fats that all show an iodine value which is too low and/or a stearic acid content which is too high for best results. Again, in U.S. Pat. No. 3,083,882 (Gooding et al) a fully hardened fat contributes, with the palm kernel oil with which it is co-randomised, a stearic acid content that is probably too high in all possible proportions of the components in the product, the iodine value of which is in any event too low for best results in confectioners' fats.

U.S. Pat. No. 3,396,037 (Bell et al) discloses a rearranged fat for use as a hard butter which is characterised by a rapid setting time and is based on a randomised lauric fat optionally hydrogenated and blended with a non-lauric fat or other fatty acid ester intended to supplement for example the stearic acid content of the fat. As with the preceding disclosures however, the Patent fails to emphasise the selection of compositions represented by the stearic acid content and degree of unsaturation which must be met to give the most suitable fat composition for confectioners' butter.

This invention relates to edible fat compositions, more particularly of the kind known as confectioners' butters.

Confectioners' butters are used in fillings for biscuits, candies and chocolate bars. They find widespread use also in cake fillings.

Lauric fats, chiefly coconut, palm kernel, babassu and tucum oils are themselves a valuable source of confectioners' butters, providing in a substantial measure, often after fractionation and/or hardening, the requirements for these products, chiefly sharp melting characteristics over a narrow temperature interval and range from products which are crisp and easily snapped to others which while firm at 20° C. are yet moderately soft to the tooth on biting. They change to a wholly-melted, thin liquid at about 33° C. or slightly above, in the region of body temperature. Their composition chiefly comprises lauric glycerides with varying amounts of other combined fatty acids, particularly myristic acid.

The present invention provides confectioners' butter having iodine value of from 10-25, and the fatty acid composition in random distribution of a blend of a non-lauric fat with a lauric fat, the said composition comprising at least 88 wt % C<sub>10</sub>-C<sub>18</sub> fatty acids including not more than 25 wt % stearic acid. Preferably the stearic acid content is less than 15 wt %. Blends are further preferred which have iodine values of at least 12.

Preferably also the non-lauric fat is steeply-melting and has an iodine value of less than about 20 and a slip melting point of at least 20° C., but particularly at least 35° C. and more especially at least 45° C.

By a steep melting non-lauric fat is meant one having a dilatation drop of at least 500, preferably at least 700 and more particularly 1000, within 10° C. and preferably within 5° C. of the slip melting point of the fat.

The invention includes compositions based on lauric and non-lauric fat fractions, whether obtained by dry fractionation, solvent fractionation or fractionation techniques in which aqueous surfactant solutions are used, in addition to the whole fats. Moreover, the non-lauric fat may be a hydrogenated fat, whether partly or fully hydrogenated, or a stearine thereof.

For the lauric fat component, palm kernel oil is particularly suitable, although babassu, coconut or tucum

oil may for example also be used, preferably after removal of a stearine fraction which may itself be a suitable source of confectioners' butter. The invention thus enables increased yields of confectioners' butter to be provided from a lauric fat, by utilising an oleine fraction in addition to the conventional stearine fraction.

A wide range of fats is suitable for providing the non-lauric component of the interesterified blend according to the present invention. Preferably the non-lauric component comprises a C<sub>16</sub>/C<sub>18</sub> vegetable oil, a very suitable source being palm oil. Others include for example oleines from sal fat. The specified requirements for the product, particularly as to iodine value and stearic acid content, must however be met and to this end it may be necessary to modify the fat selected for the non-lauric fat, for example by hydrogenation and fractionation.

The extent to which the lauric or non-lauric components of the interesterified blends according to the invention are first fractionated or the non-lauric component hydrogenated, if at all, may be varied in accordance with the particular requirements for the product, subject to meeting the above-stated characteristics. However, confectioners' butters are characterised by a sharp melting range somewhat below body temperature, reflected in a drop of dilatation values of at least 500, more preferably at least 700 over the last 10° C. below the slip melting point, which should be between 28° and 40° C., preferably between 30° and 37° C. and especially 30°-35° C. Any fractionation and hydrogenation of the components for the interesterified product should therefore be carried out with this end in view. Where the confectioners' butter is intended for use in biscuit creams the D<sub>20</sub> should be below 1500 and preferably below 1100, but preferably at least 900, while its D<sub>30</sub> should be about 300.

A suitable palm oil fraction is provided by the higher melting residue obtained by solvent fractionation of palm oil to obtain a mid-fraction suitable for use as a cocoa butter extender. The said fraction obtained under these circumstances has an iodine value of from 25-40, and the stearine fraction has an iodine value of about 5-20, preferably 8-15, and a slip melting point of 50° C. or more, according to the source of the palm oil and the extent to which it is fractionated to obtain the mid-fraction. Other fractionation techniques may however be used, if necessary in conjunction with hydrogenation, to yield a fraction preferably having a slip melting point of at least 45° C. and more preferably at least 50° C. and an iodine value of at most 20, preferably 2-15, for the non-lauric component of the invention. It is usually necessary to hydrogenate dry fractionated palm stearine to achieve a D<sub>20</sub> of at least 500 in the interesterified product.

A suitable source of a palm kernel fraction as the lauric component is the oleine residue remaining after removal of a stearine fraction for confectioners' butter from palm kernel oil, whether by dry, solvent or other fractionation. The oleine fraction thus obtained generally has an iodine value of from 15 to 25.

The proportion of the lauric and non-lauric components of the products of the invention may be varied between wide limits. Preferably however the lauric-non-lauric weight ratio is less than about 5:1, and more preferably the lauric component is the major component in a ratio up to 4:1, especially up to 3:1, to allow the quick melting characteristics of the lauric fat to persist

in the blend. The setting point is preferably between 25° and 30° C., preferably about 27.5° C.

The interesterification is carried out in a conventional manner, the fat blend being melted and the reaction carried out in the presence of an effective amount of an interesterification catalyst. This is preferably a hydroxide or lower alkoxide of an alkali metal, preferably sodium, or the alkali metal itself. Sodium methoxide, sodium hydroxide and sodium metal are particularly preferred. Reference may be made for the purpose of carrying out the interesterification to our co-pending Case No. A.267, British Patent Application No. 33362/68. The process may be carried out at temperatures between 15° and 150° C., provided the fat blend is liquid. Preferably however the interesterification is carried out within the range from 50°-100° C., for example 70° C. At such temperatures the reaction is usually completed within an hour. The amount of catalyst used is preferably between 0.01 and 5% by weight, preferably between 0.1 and 1%, for example 0.5%.

Small amounts of additional fat components may be included before or after interesterification, provided these do not markedly influence the sharp melting characteristics of the interesterified blend.

Deodorisation markedly improves the eating qualities of the interesterified blend, but is also useful in removing any volatile components formed during the interesterification, e.g. methyl esters formed by reactions in which sodium methoxide was the catalyst. The presence of such volatile components may lower the dilatation results slightly. The physical properties of an undeodorised product should therefore be used with some caution, as it is those of the fully refined and deodorised product which relate to its performance in an edible composition, and to which therefore reference is made in the text, except where otherwise stated.

In the preparation of biscuit filling creams, coatings and the like, the fat compositions of the invention are usually blended with a suitable sweetening agent, preferably icing sugar, in an amount preferably from 2:3 to 3:2 parts by weight. Other additives or bulking agents may be added to reduce the fat content, e.g. milk powder and whey powder, in addition to flavouring agents, e.g. vanilla, or defatted cocoa powder.

Dilatation values of the non-lauric fat component of the invention may be measured in accordance with the method described in our British Pat. No. 855,349 (Case L.114). Where difficulty is experienced in applying this method, for example to very hard palm oil fractions or other very hard fats whose crystallisation and expansion characteristics may lead to the formation of vacuoles and gas bubbles which invalidate the experiment, or even crack the glass where used, alternative methods for determining the solids content at specified temperatures are shown, including nuclear magnetic resonance, differential thermal analysis and differential scanning calorimetry.

Iodine values referred to in the text are measured according to Wije' No. 1 method described in British Standard Specification No. 684/1958 on page 74 and slip melting points as described on page 14 of the same reference.

It will be clear to those practised in the art, that where a small reduction in the iodine value of the mixture is desired to satisfy the demands of the final application, this may be achieved by hydrogenating the lauric component, the nonlauric component, or both, or by hydrogenating the blend either before or after inter-

sterification, provided that in each case the final iodine value is within the required range. In general however, where hydrogenation is an expensive process it will be most economic to hydrogenate one of the components, for instance the non-lauric component, instead of the blend. On the other hand, where the colour, taste and shelf-life of the final product are of great importance, it may be of advantage to carry out the hydrogenation after the interesterification.

#### EXAMPLE 1

75 parts by weight of an oleine fraction remaining after fractionation of palm kernel oil using an aqueous solution of surfactant to recover a stearine of iodine value 8 for the manufacture of confectioners' butter, was interesterified with 25 parts by weight of a stearine recovered after acetone fractionation of palm oil to obtain a palm mid-fraction for use in cocoa butter substitutes. The slip melting point of the palm-stearine was 58° C., its dilatation at 35° C. about 1500 and at 60° C. nil. The interesterification was carried out at 105° C. using 0.2% by weight of sodium methoxide, the blend being stirred throughout the interesterification and for an hour afterwards, during which time the blend was permitted to cool to 30° C. The interesterified mixture was then washed several times with water at 40° C. to extract the catalyst, and deodorised at about 175° C. and 4 mm Hg pressure with steam admitted under the fat surface.

#### EXAMPLE 2

A similar product was prepared in the same manner, using the same lauric and non-lauric fat components in the interesterification but in the proportions 70:30 parts by weight.

The characteristics of the interesterified blends of both Examples appear in Table I.

TABLE I

|                 | Fatty Acid                      | Palm Kernel Oleine | Palm Stearine | Examples |      |
|-----------------|---------------------------------|--------------------|---------------|----------|------|
|                 |                                 |                    |               | 1        | 2    |
| Saturated       | C <sub>8</sub> -C <sub>11</sub> | 4.8                | —             | 3.7      | 3.4  |
|                 | C <sub>12</sub>                 | 4.1                | —             | 3.1      | 2.9  |
|                 | C <sub>14</sub>                 | 4.3                | —             | 33.6     | 31.3 |
|                 | C <sub>16</sub>                 | 12.5               | 1.6           | 9.8      | 9.3  |
|                 | C <sub>18</sub>                 | 8.6                | 81.1          | 26.8     | 30.5 |
| Monosatur.      | C <sub>18</sub>                 | 2.9                | 6.0           | 3.7      | 3.8  |
|                 | C <sub>18</sub>                 | 19.7               | 10.4          | 17.4     | 16.9 |
| Di-unsat.       | C <sub>18</sub>                 | 2.3                | 0.9           | 1.9      | 1.9  |
| Iodine value    |                                 | 21                 | 10            | 18       | 17.4 |
| Slip M.P. °C.   |                                 | —                  | 58            | 32       | 34.5 |
| D <sub>25</sub> |                                 |                    |               | 970      | 1110 |
| D <sub>35</sub> |                                 |                    |               | 275      | 405  |
| D <sub>45</sub> |                                 |                    |               | 20       | 105  |
| D <sub>55</sub> |                                 |                    |               | 15       | 15   |
| D <sub>65</sub> |                                 |                    |               | Nil      | Nil  |

Biscuit filling creams were prepared from each of the interesterified blends after deodorisation by mixing 40% of the blend with 60% icing sugar and 0.1% vanilla flavouring, by weight. A tasting panel consisting of 6 experts pronounced the products to be excellent and the second, containing 70% lauric fat, to be especially suitable for a summer grade filling cream, being particularly easy to spread and with good adhesion to biscuits.

The interesterified blend of Example 2 was further examined as follows:

|                                               |                      |
|-----------------------------------------------|----------------------|
| Initial Peroxide Value                        | 0.6 meq/Kg.          |
| Accelerated Induction Period (Sylvester test) | 121 min. at 20 hours |
| Taste                                         | Good                 |
| Lovibond colour in 3½ inch                    | 1.6 Red              |

tained by acetone fractionation, were interesterified as described in Example 1.

The catalyst was removed and the interesterified fat product deodorized and found to be satisfactory for use in biscuit fillings.

The fat product analysis was as follows:

| I.V. | Slip M.Pt. | Distillation |        |        |        |  | Combined acids wt %              |         |
|------|------------|--------------|--------|--------|--------|--|----------------------------------|---------|
|      | °C.        | 20° C.       | 25° C. | 30° C. | 35° C. |  | C <sub>10</sub> -C <sub>18</sub> | Stearic |
| 21.0 | 30.4       | 710          | 380    | 120    | 0      |  | 96.2                             | 1.5     |

|                 |                   |
|-----------------|-------------------|
| oil             | 10.0 Yellow.      |
| Free fatty acid | 0.03% (as lauric) |

These results demonstrate the excellent quality of the product.

#### EXAMPLE 3

75 parts of the palm kernel oleine described in Example 1 were interesterified as described in that Example, but with 25 parts of a steeply-melting hydrogenated palm oil stearine. The stearine was obtained in 28% yield by cooling palm oil quickly from 80° C. to 27-28° C. agitating for 1 hour at that temperature and filtering. Before interesterification the iodine value of the stearine was decreased from 47.2 to 2.2 and its slip melting point increased to 57.1° C. by hydrogenation at 180° C. and 20 psig using 0.5 wt % nickel-on-kieselguhr catalyst containing 17 wt % nickel. The combined acid analyses of the stearine before and after hydrogenation was as follows, expressed as wt %:

|                                  |                                    |                   |
|----------------------------------|------------------------------------|-------------------|
| myristic 1.9;<br>oleic 33.0/2.6; | palmitic 31.4;<br>linoleic 7.6/ml. | stearic 6.1/44.1; |
|----------------------------------|------------------------------------|-------------------|

The interesterified product analysis was as follows:

| I.V. | Slip M.Pt. | Distillation |          |        |        |  | Combined acids wt %              |         |
|------|------------|--------------|----------|--------|--------|--|----------------------------------|---------|
|      | °C.        | 20° C.       | 25° C.   | 30° C. | 35° C. |  | C <sub>10</sub> -C <sub>18</sub> | Stearic |
| 15.4 | 34.1/33.5° | 1080/1120°   | 346/345° | 20/20° |        |  | 96.3                             | 13.1    |

\*After deodorization

After deodorization this interesterified product changed only slightly in composition and was also found to provide satisfactory biscuit fillings. It had a good taste and a peroxide value of zero, indicating good keeping and flavour stability properties.

#### EXAMPLE 4

A satisfactory confectioners' butter was obtained by interesterification, as described in Example 1, of a blend of 75% palm kernel oleine and 25% palm stearine of iodine values 21.0 and 10.2, both obtained by acetone fractionation. The product analysis was as follows:

| I.V. | Slip M.Pt. | Distillation |        |        |          |        | Combined acids wt %              |         |
|------|------------|--------------|--------|--------|----------|--------|----------------------------------|---------|
|      | °C.        | 20° C.       | 25° C. | 30° C. | 32.5° C. | 35° C. | C <sub>10</sub> -C <sub>18</sub> | Stearic |
| 18   | 31.4       | 820          | 495    | 200    | 80       | 0      | 96.4                             | 1.7     |

#### EXAMPLE 5

80 parts of palm kernel oleine of iodine value 24.3 and 20 parts of palm stearine of iodine value 8.7; both ob-

#### EXAMPLE 6

Palm stearine, obtained by dry fractionation and hydrogenated as described in Example 3, except that the hydrogenation was discontinued at about I.V. 30, was randomly interesterified at 110° C. with equal parts by weight of palm kernel oleine of iodine value 20 and coconut oil of iodine value 8.8, using 0.25 wt % sodium methoxide as catalyst. The catalyst was inactivated with water and the fat deodorized.

The deodorized product was evaluated as a confectionery fat by blending with 1½ times its weight of icing sugar to make a biscuit filling cream, which was found to be comparable in appearance with a standard commercial product and superior in flavour, as judged by a taste panel.

Particulars of the fats appear in Table II.

TABLE II

|                                       | Palm Stearine        |                     | Intesterified Blend |
|---------------------------------------|----------------------|---------------------|---------------------|
|                                       | Before hydrogenation | After hydrogenation |                     |
| Iodine value                          | 41.9                 | 30.2                | 19.6                |
| Slip M.Pt. °C.                        | 48.0                 | 49.5                | 32.3                |
| Distillation                          |                      |                     |                     |
| D <sub>20</sub>                       | 1200                 | 1925                | 965                 |
| D <sub>25</sub>                       | 1080                 | —                   | 600                 |
| D <sub>30</sub>                       | 965                  | 1770                | 270                 |
| D <sub>35</sub>                       | 856                  | 1565                | 25                  |
| D <sub>40</sub>                       | 730                  | 1280                | 15                  |
| D <sub>45</sub>                       | 565                  | 835                 | 0                   |
| D <sub>50</sub>                       | 300                  | 185                 | 0                   |
| D <sub>55</sub>                       | 0                    | 5                   | 0                   |
| Combined fatty acids                  |                      |                     |                     |
| C <sub>10</sub> -C <sub>18</sub> wt % |                      |                     | 92.3                |
| Stearic wt %                          |                      |                     | 4.8                 |

#### EXAMPLE 7

A blend containing 65% coconut oil (CN) and 35% dry fractionated palm stearine (PS) of iodine value 42 was interesterified at 115° C. using 0.25% of sodium methoxide catalyst. The washed and dried material was then hydrogenated with 0.25% nickel catalyst at 180° C. for 15 minutes to give a product of iodine value 14.6.

After deodorization the interesterified and hardened blend was found superior to the standard commercial product with respect to colour, taste and shelf-life. It was evaluated as a biscuit cream filling in a blend of

60% icing sugar, 40% fat and gave an exceptionally white and fluffy mix. It also gave a smooth melt-down