

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

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SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO



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Patente de Invención	☒	Patente de Modelo de Utilidad	☐
Vía Nacional	☐		
Vía PCT (fase nacional)	☒	Cap. I	☐ Cap. II ☒

No. Sol. Internacional **PCT/EP2005/007382**
Fecha de Presentación Internal. **8 de Julio de 2005**

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

- | | | | |
|------|--------------------------|---|---------------------------------|
| 1.1. | <u>Descripción:</u> | Folios: <u>31 a 54</u> | tal como se radicó inicialmente |
| 1.2. | <u>Reivindicaciones:</u> | Folios <u>55 a 56</u> | tal como se radicó inicialmente |
| 1.3. | <u>Dibujos:</u> | Folios <u>57</u> | tal como se radicó inicialmente |
| 1.4. | <u>Prioridad:</u> | Fecha 9 de julio de 2004
País Estados Unidos
Número 60/586236 | |

2. Análisis de la Prioridad

NO es posible aceptar las prioridades relacionadas, toda vez que NO corresponden a la misma materia de la solicitud en estudio.

- *La prioridad relaciona una solicitud dirigida a productos lácteos en polvo; la solicitud presentada en Colombia vía PCT relaciona productos en polvo genéricos.*
- *Las características de cada uno de los productos relacionados en la prioridad difieren de lo relacionado en la solicitud colombiana:*
 - *La densidad en la prioridad está entre 0.1 -0.9 g/ml; en la solicitud colombiana entre 0.1- 0.6 g/ml*

- La porosidad abierta en la prioridad está entre 10 y 30%; en la solicitud colombiana entre 10 y 45%
- La porosidad cerrada en la prioridad está entre 0 y 70%; en la solicitud colombiana está entre 15 y 70%
- Etc.

Por lo anterior, no es posible aceptar la prioridad relacionada.

3. Objeto de la invención

- Título de la solicitud (folio 1)
Confite en polvo sinterizado
- Las reivindicaciones 1 a 10 de la solicitud en estudio se refieren a
 - 1.- Un confite en polvo sinterizado CARACTERIZADO porque, comprende al menos un polvo sinterizado con una textura liviana la cual tiene una densidad de 0,1-0,6 g/ml, una porosidad cerrada de 15 a 70%, una porosidad abierta de 10-45%, una porosidad total de 15-90%.
 - 6.- Un método para la producción de un confite en polvo...
 - 10.- Un confite en polvo sinterizado.
- Los anteriores productos y procedimiento buscan proporcionar un confite.
- La Clasificación Internacional de Patentes (IPC) para esta solicitud es A 23 P 1/10

4. De la solicitud de Patente

4.1. Descripción (Artículo 28 D. 486)

La descripción de la solicitud en estudio presenta los siguientes defectos:

- La solicitud es ambigua en su presentación.
 - No especifica problema técnico alguno (es un objetivo de la presente invención el obviar o mitigar al menos una desventaja de los productos de confitería sinterizados, anteriores y los métodos de producción) sino que enuncia un deseo, evidentemente subjetivo.
 - Los objetivos también son etéreos. "Es **deseable** proveer un confite que sea capaz de entregar un **alimento liviano**, con la **sensación de disolución rápida**" (¿deseable? ¿alimento liviano? ¿sensación de...? ¿disolución rápida?); **¿fundir en la boca que no sacia completamente?**; "es un objetivo de la presente invención el **obviar o mitigar al menos una desventaja de los productos de confitería sinterizados**, anteriores y los métodos de producción" ¿obviar o mitigar al menos una desventaja de los productos de confitería?, etc.
 - Relaciona varios aspectos de la invención (en un primer aspecto de la invención... en otro aspecto de la invención... en otro aspecto de la invención... otros aspectos y características de la presente invención) pero no define con claridad cual es realmente la supuesta invención.
 - Relaciona de forma desordenada un buen número de compuestos que podrían formar parte de la supuesta invención, pero como nunca se define cual es la invención dicha descripción se vuelve inconexa, poco clara, superficial, no reproducible, inentendible y etérea.
 - El solicitante relaciona en el folio 41, según él, "un aspecto de la invención", la cual es finalmente la que reivindica. Sin embargo, se trata de una serie de parámetros que no necesariamente guardan relación con lo señalado en folios anteriores, que no explica las diferencias con el arte conocido, que no tiene una fundamentación del porque son

importantes o distintivos o del como los obtuvo, que son simplemente datos y no revelan o muestran la supuesta invención.

- El solicitante relaciona una porosidad abierta, una cerrada y una total. Un conocedor del arte sabe que la porosidad total debe ser la suma de la porosidad abierta y la porosidad cerrada. Luego si la porosidad total es 15%, la suma de las porosidades abierta y cerrada no deberían sobrepasar dicho valor; sin embargo al sumar el valor mínimo de la porosidad abierta (10%) y el valor mínimo de la porosidad cerrada (15%) es imposible obtener el valor señalado por el solicitante. Luego la solicitud además presenta incongruencias.
- Así como los objetivos son etéreos, también lo son los resultados: "El producto de acuerdo a la invención tiene... una estructura y un efecto en la boca que son desconocidos en el campo de la confitería". (¿?)
- Puede afirmarse que la descripción se encuentra mal presentada y que no revela ninguna invención sino una suma de compuestos y parámetros arbitrarios inconexos. El solicitante debe recordar que "La descripción deberá divulgar la invención de manera suficientemente clara y completa para su comprensión y para que una persona capacitada en la materia técnica correspondiente pueda ejecutarla. La descripción de la invención indicará el nombre de la invención e incluirá la siguiente información: a) el sector tecnológico al que se refiere o al cual se aplica la invención; b) la tecnología anterior conocida por el solicitante que fuese útil para la comprensión y el examen de la invención, y las referencias a los documentos y publicaciones anteriores relativas a dicha tecnología; c) **una descripción de la invención en términos que permitan la comprensión del problema técnico y de la solución aportada por la invención, exponiendo las diferencias y eventuales ventajas con respecto a la tecnología anterior;** d) una reseña sobre los dibujos, cuando los hubiera; e) una descripción de la mejor manera conocida por el solicitante para ejecutar o llevar a la práctica la invención, utilizando ejemplos y referencias a los dibujos, de ser éstos pertinentes;". Como se puede observar casi ninguno de los requisitos los cumple la actual solicitud.

Por lo anterior, la descripción no cumple con el requisito de claridad y/o divulgación completa que permita su comprensión y ejecución de acuerdo al art. 28 de la Decisión 486 y/o art. 22 del Tratado PCT

4.2. Reivindicaciones (Artículo 30 D. 486)

El capítulo reivindicatorio de la solicitud en estudio presenta los siguientes defectos:

- *El solicitante relaciona una porosidad abierta, una cerrada y una total. Un conocedor del arte sabe que la porosidad total debe ser la suma de la porosidad abierta y la porosidad cerrada. Luego si la porosidad total puede ser 15% según las reivindicaciones, la suma de las porosidades abierta y cerrada no deberían sobrepasar dicho valor; sin embargo al sumar el valor mínimo de la porosidad abierta (10%) y el valor mínimo de la porosidad cerrada (15%) es imposible obtener el valor señalado por el solicitante. Luego la solicitud es incongruente.*
- *Las reivindicaciones no están definidas. La reivindicación 1 y sus dependientes se basan en parámetros arbitrarios que no permiten una comparación explícita con el arte previo. Además, enuncia a cualquier polvo sinterizado, abundante en el arte dejando de lado características técnicas que lo pueden diferenciar.*
- *La reivindicación 5 es inaceptable dado que está caracterizada por criterios totalmente subjetivos (calidad de fundir en la boca, crujiente, no sacia completamente). Deberá eliminarse*

- La reivindicación 6 no está definida. Obsérvese que el supuesto proceso se reduce a sinterizar un material particulado no compactado, operación unitaria de uso común en el arte. No existe ninguna característica real que permita diferenciar dicha operación unitaria y que configure un proceso existente.
- La etapa 8 es totalmente etérea e inaceptable. Se basa en un deseo y o en un hecho real; "prevenir la pérdida de humedad del polvo lácteo" es un objetivo a lograr y no una operación unitaria configurada.
- No se precisa la materia sobre la cual se solicita protección. El producto de la reivindicación 1 no necesariamente está relacionado con el supuesto método de las reivindicaciones 6 y siguientes.
- Puede afirmarse que la solicitud se encuentra muy mal presentada y que no es posible realizar un correcto análisis de fondo dados los profundos problemas que posee el documento

Por lo anterior, el capítulo reivindicatorio no cumple con el requisito de definición, claridad, concisión o sustento por la descripción de acuerdo al art. 30 de la Decisión 486 y/o art. 22 Tratado PCT.

5. Determinación del Estado de la Técnica

De acuerdo a lo observado, **NO** es posible realizar una correcta **Determinación del Estado de la Técnica y Evaluación de los requisitos de patentabilidad**. Solo cuando se haya corregido adecuadamente la solicitud y se haya orientado de forma tal que sea claro lo que quiere ser protegido, sólo en ese momento esta oficina podrá elaborar una determinación correcta del estado de la técnica y una evaluación correcta de los requisitos de patentabilidad.

6. Sobre los exámenes en fase internacional

Esta oficina está en total acuerdo con los exámenes practicados en fase internacional, exámenes estos que requirieron al solicitante por su falta de claridad y falta de los requisitos de patentabilidad vistos los documentos citados allí. Por consiguiente, el solicitante deberá tener presente que esta oficina reitera todo lo enunciado en el informe de búsqueda y en el Examen preliminar de la fase internacional.

7. Conclusión:

En cumplimiento del artículo 45 de la Decisión 486 de la Comisión de la Comunidad Andina, se le indica que debe dar respuesta dentro del término de SESENTA días contados a partir de la fecha de notificación de la presente comunicación. En caso de no dar respuesta al presente requerimiento, o si a pesar de la respuesta subsistieran los impedimentos para la concesión, se denegará la patente. Notifíquese el presente oficio conforme a lo dispuesto en el numeral 5.2, literal e), del capítulo quinto del título primero de la Circular Única N° 10 de 2001.


Alix Carmanza Céspedes De Vergel

Directora de Nuevas Creaciones (C)

Concepto Técnico No. 2955

Examinador Técnico 202003

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

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(54) Title (EN): SINTERED POWDER CONFECTION

(54) Title (FR): CONFECTION DE POUDRE FRITTEE

(57) Abstract:

(EN): A sintered powdered confection and methods for making the same are provided.

(FR): L'invention concerne une confection de poudre frittée et des procédés de fabrication de celle-ci.

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Declarations:

Declaration made as applicant's entitlement, as at the international filing date, to apply for and be granted a patent (Rules 4.17(ii) and 51bis.1(a)(ii)), in a case where the declaration under Rule 4.17(iv) is not appropriate

Declaration made as applicant's entitlement, as at the international filing date, to claim the priority of the earlier application, where the applicant is not the applicant who filed the earlier application or where the applicant's name has changed since the filing of the earlier application (Rules 4.17(iii) and 51bis.1(a)(iii))

Declaration of inventorship (Rules 4.17(iv) and 51bis.1(a)(iv)) for the purposes of the designation of the United States of America

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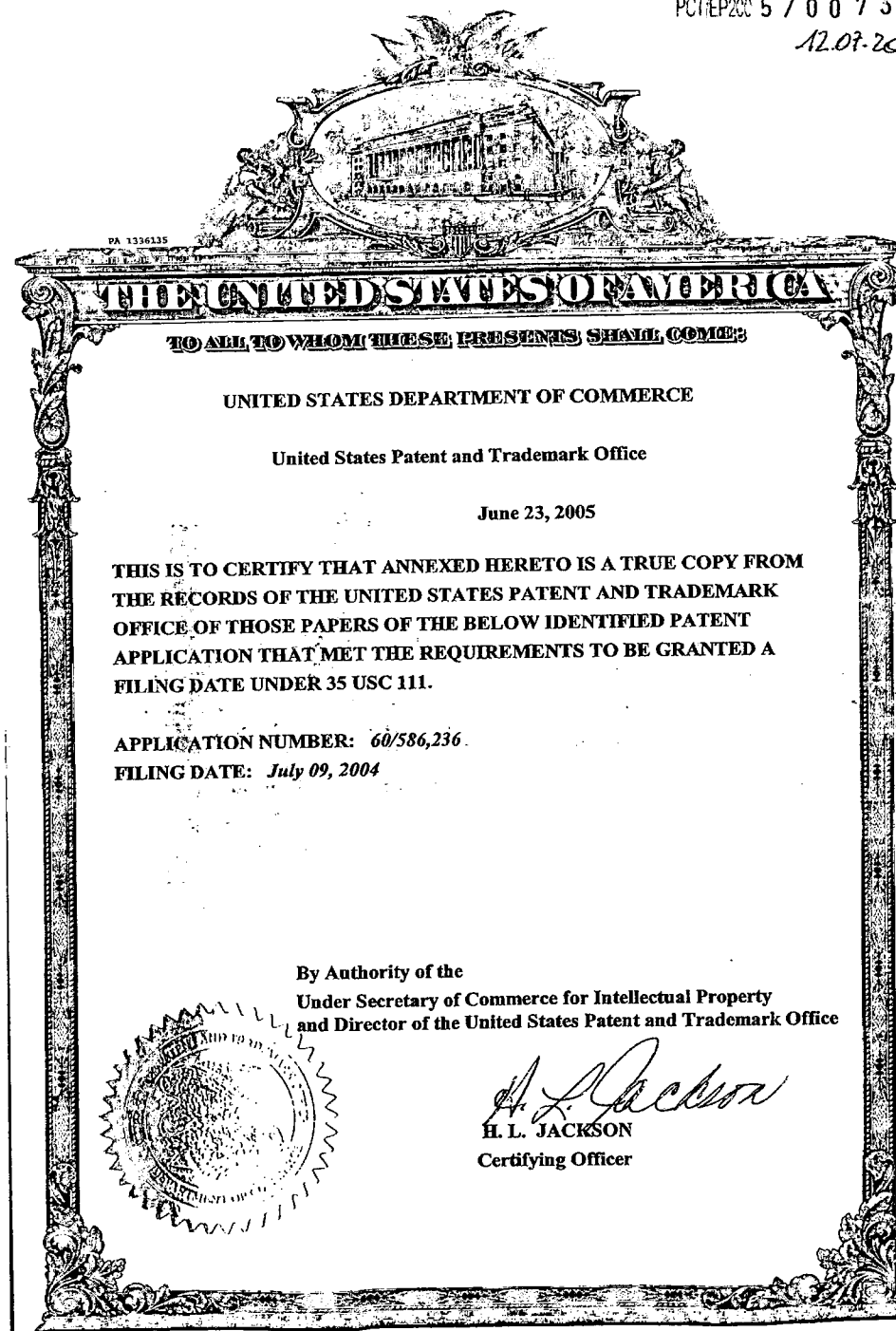
Remark: Priority document submitted or transmitted to the International Bureau in compliance with Rule 17.1(a) or (b)



World Intellectual Property Organization (WIPO) - Geneva, Switzerland
Organisation Mondiale de la Propriété Intellectuelle (OMPI) - Genève, Suisse

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PROVISIONAL APPLICATION FOR PATENT COVER SHEET
This is a request for filing a PROVISIONAL APPLICATION FOR PATENT under 37 CFR 1.53(b).

INVENTOR(S) Given Name (first and middle if any) _____ Family Name or Surname _____ (City and either State or Foreign Country) _____		Residence _____ (City and either State or Foreign Country) _____	
Additional Inventions are being named on the _____ separately numbered sheets attached hereto			
TITLE OF THE INVENTION (500 Characters max) SINTERED DAIRY POWDER CONFECTION			
Directed at correspondence to: CORRESPONDENCE ADDRESS			
☒ Customer Number: _____ 42534		OR ☐ Firm or Individual Name _____ Address _____ Address _____ City _____ State _____ Zip _____ Country _____ Telephone _____ Fax _____	
ENCLOSED APPLICATION PARTS (check all that apply)			
☒ Specification Number of Pages <u>12</u>		☐ CO(s), Number _____	
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☐ Application Date Sheet. See 37 CFR 1.78			
METHOD OF PAYMENT OF FILING FEES FOR THIS PROVISIONAL APPLICATION FOR PATENT			
☐ Applicant claims small entity status. See 37 CFR 1.37.		FILING FEE Amount (\$)	
☐ A check or money order is enclosed to cover the filing fees.		\$160.00	
☒ The Director is hereby authorized to charge filing fees or credit any overpayment to Deposit Account Number: <u>501593</u>			
☐ Payment by credit card. Form PTO-2038 is attached.			
The invention was made by an agency of the United States Government or under a contract with an agency of the United States Government.			
☒ No.			
Yes, the name of the U.S. Government agency and the Government contract number are: _____			

USE ONLY FOR FILING A PROVISIONAL APPLICATION FOR PATENT

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SINTERED DAIRY POWDER CONFECTION

FIELD OF THE INVENTION

[0001] The present invention relates to a sintered dairy powder confection.

BACKGROUND OF THE INVENTION

[0002] US Patent No. 4,394,395 entitled "Process for the Production of a Molded Food Product by Sintering" to Rastagno et al. relates to a process for making individual moulded food articles from powdered food starting materials, especially low fat, high carbohydrate-containing starting materials. The moulded powdered starting materials are uncovered to reduce the humidity in the final product and are subject to pressure to compact the particles prior to sintering. As a result the products from this type of process are typically hard, brittle, or dry.

[0003] It is desirable to provide a dairy powder confection that is capable of delivering high milk solids in a light-eating format. A light-eating format is one where the texture is characterized by a melt-in-your mouth quality, being non-satiating, having a porous structure, and being crisp.

SUMMARY OF THE INVENTION

[0004] It is an object of the present invention to obviate or mitigate at least one disadvantage of previous sintered confectionary products, and methods for their production.

[0005] In a first aspect of the present invention a sintered dairy powder confection, comprising a center piece consisting of a sintered dairy powder, with a light texture, characterized by a density of 0.1 - 0.9 g/ml, a closed porosity of 0 to 70%, a pocket porosity of 10-30%, a total porosity of 15-90%, a hardness of 4000-40000 g of force, and a dissolution rate of 1-60 seconds (1g of sample in 100ml of water at 60°C with agitation).

[0006] In another aspect of the present invention there is provided a sintered dairy powder confection, comprising a center piece consisting of a sintered dairy powder, with a moisture content of less than 10% and with a texture having a melt-in-your mouth quality, a porous and crisp structure, and being non-satiating.

[0007] In another aspect, the invention provides there is provided a method for the production of a dairy powder confection, comprising the steps of obtaining a dairy powder starting material comprising individual particles; and without subjecting the dairy powder to compacting, sintering the dairy powder, such that the individual particles melt at their surface and adhere to one another to form a structured, porous, fused product.

[0008] Other aspects and features of the present invention will become apparent to those ordinarily skilled in the art upon review of the following description of specific embodiments of the invention.

DETAILED DESCRIPTION

[0009] This invention relates of a sintered dairy product, which can be used in a dairy confection, such as the center of a dairy confection. The sintered dairy product may be covered with one or more layers, such a layer of chocolate, like white chocolate, milk chocolate, dark chocolate, compounds chocolate or other confectionary coating including sugar based confectionery products.

[0010] The sintered dairy product center is made from a dairy powder. The dairy powder contains a dairy component which may be any milk-derived product or component of milk, such as at least one of milk, cream, condensed milk, anhydrous milk fat, milk solids, milk protein, milk protein isolates, whey, butter, yoghurt, casein, caseinate salts, and protein-containing dairy substitutes. Dairy substitutes may include soy protein, soy protein isolates, soymilk, wheat protein, wheat protein isolates, and coconut milk. Preferable dairy components are milk powder, such as skim milk powder or whole milk powder. The dairy component is preferably chosen such that the resulting texture of the product is porous, crisp, and has a melt-in-your-mouth quality.

[0011] When prepared from whole milk or skim milk powder, and other milk-derived products, the sintered dairy product center can provide the consumer with a high milk solid product in a "light-eating" format. Light-eating is a term used to describe the texture of the product. Advantageously, the product of the present invention may be crisp, porous, have a melt-in-your mouth quality, and be non-satiating. This sintered dairy product center is more nutritious than many other confectionary products, having comparable amounts of milk solids to a glass of fluid milk, enhanced calcium content, and elevated milk protein levels. For instance, in terms of milk solids, a bar made from a dairy powder containing 70% milk powder, and coated with white chocolate can deliver approximately 28g of milk solids in a serving size ranging from 50g to 70g depending on whether a spray-dry blend or dry mix blend is used as the starting dairy powder. At the same time, the dairy product center provides a light, less satiating eat than traditional fat-based confectionery. The flavor of the product is that of fresh milk. This combination of product attributes (high milk solids, fresh milk flavour, light-eating texture) is presently non-existent in the confectionery area.

[0012] The sintered dairy product may also contain a sweetener. Sweeteners which may be employed in the present invention are known in the art and include, but are not limited to, corn syrup, such as high maltose corn syrup, wheat syrups, low molecular weight starches or maltodextrins, sucrose, fructose, aqueous cane sugar, dextrose, maltose, lactose, maltitriose, molasses, honey, galactose, and sugar substitutes known in the art such as sorbitol, xylitol, mannitol, lactitol, saccharin, aspartame, maltitol, or isomalts, and mixtures thereof.

[0013] According to one aspect, the proportion of sweetener in the starting dairy powder may be 0-50% by weight based on the weight of the dairy powder starting material. Preferably the weight of sweetener, such as sucrose, in the starting dairy powder is 10-20%. In one aspect, the invention provides a dairy confection made from a dairy powder containing 60-90% milk powder (such as whole milk powder), 10-20% sucrose, and 10-20% maltodextrin. In one aspect, the dairy powder starting material contains 70% milk powder, 15% sucrose, and 15% maltodextrin.

[0014] Preferably, the starting dairy powder starting material is principally glass, such as for example at least 75% glass, more preferably 85% glass, and possibly 100% glass.

[0015] Preferably the dairy confection center has a moisture content of less than 10%, more preferably less than 5%, desirably less than 4%.

[0016] The sintered dairy product may include any of a number of other components, such as flavourings, colourants, fillers, acidulants, stabilizers, emulsifiers, buffering agents, and small confectionary products. Examples include fruit extracts, fruit powders, maltodextrins, cocoa, coffee, chicory, cereals like malted cereals, fats, lecithins, boiled caramel, nougatine, nuts, syrup, chocolate pieces, expanded cereals, and dried fruit or size-reduced or whole candied fruit. These components may be in powder form, or may be larger pieces that are blended with the dairy powder, such as chocolate or fruit pieces.

[0017] A sintered dairy confection center in accordance with one aspect of the present invention can have a light texture. This light texture results from a structured porous structure that, after biting, quickly dissolves in the mouth, leaving no sticky residue on the teeth. The texture of the product can be described both qualitatively, as well as physically. Porosity (closed porosity, open or pocket porosity, and total porosity) are measures of the amount of air present in the sample, and thus measure of the compactness of the product. The "melt-in-your-mouth" quality can be measured as a function of dissolution rate: the faster the product dissolves the more "melt-in-your-mouth" quality. Density and hardness also are measures of the texture of the product.

[0018] The product in accordance with one aspect of the invention, preferably has a density of 0.1 - 0.9 g/ml, a closed porosity of 0 to 70%, a pocket porosity of 10-30%, a total porosity of 15-90%, a hardness of 4000-40000 g of force, and a dissolution rate of 1-60 seconds for a 1g sample in 100ml of water at 60 °C with agitation. These measures are measures of texture and relate only to the dairy confection centers, i.e. they do not include a coating surrounding the dairy center.

[0019] The sintered dairy product may be covered with one or more layers, such a layer of chocolate, like white chocolate, milk chocolate, or dark chocolate, or other confectionary

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coating. The outer coating may furthermore contain nuts, fruits, cereals, candy, and other ingredients known to those skilled in the art. This outer layer, when present, can complement the flavor of the dairy product center.

[0020] The process for the production of a dairy powder confection of the invention, involves sintering. Sintering involves the bonding of adjacent surfaces of particles in a mass of powder by application of heat and/or humidity, without melting, causing the powder to form a coherent mass. Sintering strengthens a powder mass and normally produces densification. The powder mass starts in a glassy state. With sufficient heat and/or humidity the powder mass reaches a glass transition temperature (T_g), at which point the particles enter the rubbery state and become sticky on the surface and fuse to one another. When heat and/or humidity is removed, the particles return to a temperature below the T_g , and the piece returns to the glassy state as a solid. T_g is inversely related to moisture content for milk powders. Thus, if the powder is subjected to sufficient humidity, no temperature increase is required to reach the T_g .

[0021] The sintered dairy product can be made by a method comprising the steps of providing a dairy powder starting material; and without subjecting the dairy powder to compacting, sintering the dairy powder, such that the individual particles melt at their surface and adhere to one another to form a structured, porous, fused product.

[0022] The dairy powder starting material can be prepared by at least two different methods, one a spray drying method and one a dry blend method. With the spray drying method, the components of the dairy powder are dissolved in solution, and the resulting solution is spray-dried. Air, nitrous oxide, carbon dioxide, or nitrogen gas can be used to foam spray-dry the aqueous solution. Using a gas injection system serves to trap the gas in the powder. Other factors that can be used to vary the particle shape and size include the nozzle type, the viscosity of the liquid solution, and the spray rate. When spray dried together as a milk mix, the resulting powder can be entirely in the glassy state, meaning each powder particle is an amorphous structure created through rapid moisture removal and cooling without the occurrence of crystallization.

[0023] As mentioned above, other components can be added to the dairy powder either prior to spray drying (in which case they are preferably soluble) or after spray drying, such as the addition of puffed rice, or pieces of chocolate, nuts, dried fruit or other small inclusions known to those skilled in the art.

[0024] A dry blend method can also be used, in which all the dry components are simply mixed together. Again, other components can be added to the dairy powder either in powder form or as pieces, such as puffed rice, or pieces of chocolates or nuts. When dry blended together as a milk mix, the resulting powder is not typically entirely in the glassy state. For example, it may be at least 50%, at least 75%, or at least 85% glass. For instance, milk powder and maltodextrin are glasses, but sugar is not and the sugar would be in the crystalline state in the dry blend.

[0025] Preferably the particle sizes of the powdered components in both the spray-dried powder and the dry blend powder are approximately 0.02 - 3.0 mm (20 to 3000 microns).

[0026] In one aspect, the spray dry product (without a coating) may have a density of 0.1-0.4 g/ml, have a closed porosity of 45-70%, have a pocket porosity of 15-30%, have a total porosity of 60-90%, have a hardness of 4000 to 20000 g force, and have a dissolution rate of 1-30 seconds for 1 g in 100 ml water at 60 °C with agitation. It may be 100% glass.

[0027] In one aspect, the dry blend product (without a coating) may have a density of 0.4-0.9 g/ml, have a closed porosity of 0-10%, have a pocket porosity of 10-30%, have a total porosity of 15-40%, have a hardness of 10000 to 40000 g force, and have a dissolution rate of 30-60 seconds for 1 g in 100 ml water at 60 °C with agitation. It may be up to 85% glass.

[0028] The dairy powder is sintered without prior compaction. This lack of compaction is significant because compaction compromises the light and porous texture.

[0029] The temperature and or the humidity are raised such that the temperature of the powder is above the T_g . If temperatures are too high, the powder can undergo undesirable browning, caramelization, and collapse/shrinking of the structure. Upon reaching a

temperature in excess of T_g , the individual particles enter the rubbery state and become sticky on the surface and fuse to one another. Upon cooling below T_g , the piece returns to the glassy state as a solid. The time and temperature of sintering are dependent on a variety of factors, including the T_g , the composition of the powder, the moisture content of the powder, the humidity in the space in which sintering takes place, etc.

[0030] Preferably, moisture loss is prevented during sintering, for example by raising the humidity or by covering the powder during sintering. Retaining moisture enhances fusing at a lower temperature, while avoiding browning and formation of undesirable off-flavors.

[0031] Once the sintering is complete, the structured porous product can be brought to a temperature below T_g and allowed to cool to room temperature, if necessary.

[0032] The sintering may be carried out with the dairy powder in one larger recipient or in individual recipients. If the sintering is carried out with the dairy powder in one larger recipient, individual portions can be divided out after sintering, before or after cooling.

[0033] Alternatively, in one aspect, a mould can be used. The method, in such a case, could comprise the steps of loose filling a mould with a dairy powder; sintering the dairy powder such that the individual particles melt at their surface and adhere to one another to form a porous structured fused product; and removing the product from its mould. The mould may be covered during sintering to prevent moisture loss. Any type of mould, as is known in the art, can be used for making the confection, depending on the shape and size desired. Ball-shaped moulds or bar-shaped moulds can be used, for instance.

[0034] The pieces may then be coated, if desired with a further confectionary product.

Example 1

[0035] A sweetened milk mix was foam spray-dried using nitrogen gas injection, creating a low-density and high porous (30-70% closed porosity) spray dried sweet milk powder. Initial formulations of the sweet milk mix were 70% whole milk powder, 15% sucrose and 15% maltodextrin (dry basis). This powder was then used to loose-fill traditional moulds.

The moulds were covered and heated in a convection oven to elevate the temperature of the powder above that of its glass transition temperature (T_g). No compaction was used prior to heating. The oven was set at 280°F (ca. 137°C) and the confection was left in the oven for about 10 minutes. The confectionary was allowed to cool and removed from the moulds.

[0036] This piece, or confectionary center, was then enrobed in either traditional chocolate or a variety of compound coatings.

[0037] The final product is light and quick to dissolve in the mouth, and does not stick to the teeth. It delivers a high level of milk solids (70%) and has a fresh milk flavor.

Example 2

[0038] A dry blend formulation has been made as well. Compositionally, the proportions of ingredients were the same (70% whole milk powder, 15% sucrose, 15% maltodextrin). Instead of spray drying them to produce a uniform powder, the 3 materials were mixed together and then loose-filled into moulds for controlled heating and cooling as described in Example 1.

[0039] The piece was then enrobed in either traditional chocolate or a variety of compound coatings. The final product is light eating, delivers a high level of milk solids (70%) and has a fresh milk flavor.

[0040] Although compositionally this product is the same, the density of the dry blend is about three times denser than that of the spray dried powder. Texturally, the resulting piece is different as well. It is sandier due to the coarse particle size, particularly of granular sugar. However, this can be overcome through particle size reduction. Structurally, the product is different as well. Milk powder itself is a glass, the maltodextrin is likewise amorphous but free flowing, and sugar is crystalline. Therefore, the final product piece is a glassy structure of milk powder and maltodextrin within which sugar crystals are suspended.

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[0041] The above-described embodiments of the present invention are intended to be examples only. Those of skill in the art may effect alterations, modifications and variations to the particular embodiments without departing from the scope of the invention, which is defined solely by the claims appended hereto.

What is claimed is:

1. A sintered dairy powder confection, comprising a center piece consisting of a sintered dairy powder, with a light texture, characterized by a density of 0.1 - 0.9 g/ml, a closed porosity of 0 to 70%, a pocket porosity of 10-30%, a total porosity of 15-90%, a hardness of 4000-40000 g of force, and a dissolution rate of 1-60 seconds (1g of sample in 100ml of water at 60°C with agitation).
2. The confection of claim 1, wherein the center piece is characterized by a density of 0.1-0.4 g/ml, a closed porosity of 45-70%, a pocket porosity of 15-30%, a total porosity of 60-90%, a hardness of 4000 to 20000 g force, and a dissolution rate of 1-30 seconds for 1g/100 ml water at 60°C with agitation.
3. The confection of claim 1, wherein the center piece is characterized by a density of 0.4-0.9 g/ml, a closed porosity of 0-10%, a pocket porosity of 10-30%, a total porosity of 15-40%, a hardness of 10000 to 40000 g force, and a dissolution rate of 30-60 seconds for 1g/100 ml water at 60°C with agitation.
4. The confection of claim 1, wherein the dairy powder comprises 50-100% by dry weight of milk powder and 0-50% by dry weight of one or more sweeteners.
5. The confection of claim 1, further comprising an outer coating enrobing said center piece, said coating comprising a confectionary product.
6. A sintered dairy powder confection, comprising a center piece consisting of a sintered dairy powder, with a moisture content of less than 10% and with a texture having a melt-in-your mouth quality, a porous and crisp structure, and being non-satiating.
7. A method for the production of a dairy powder confection, comprising the steps of:
 - (a) obtaining a dairy powder starting material comprising individual particles; and

(b) without subjecting the dairy powder to compacting, sintering the dairy powder, such that the individual particles melt at their surface and adhere to one another to form a structured, porous, fused product.

8. The method of claim 7, further comprising the step of: preventing loss of moisture from the dairy powder during sintering.
9. The method of claim 7, wherein the dairy powder comprises 50-100% by dry weight of milk powder and 0-50% by dry weight of one or more sweeteners.
10. The method of claim 7, wherein the dairy powder starting material comprises: 65-75% by dry weight of milk powder, 10 - 20% of maltodextrin, and 10-20% of sucrose.
11. The method of claim 7, wherein the dairy powder starting material is at least 75% glass.
12. The method of claim 7, wherein the dairy powder starting material is at least 85% glass.
13. The method of claim 7, wherein the dairy powder starting material is a dry blend formulation.
14. The method of claim 7, wherein the dairy powder starting material is a spray-dried powder.
15. The method of claim 7, further comprising the step of coating the structured, porous, fused product with a chocolate-based coating.
16. A sintered dairy powder confection, made by the method of any one of claims 7 to 15.

ABSTRACT

A sintered powdered dairy confection and methods for making the same are provided.

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