

(19) World Intellectual Property  
Organization  
International Bureau



(43) International Publication Date  
13 October 2005 (13.10.2005)

PCT

(10) International Publication Number  
**WO 2005/094616 A1**

(51) International Patent Classification<sup>7</sup>: **A23L 1/24**, 1/39

(21) International Application Number:  
PCT/EP2005/002373

(22) International Filing Date: 4 March 2005 (04.03.2005)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:  
04251835.7 29 March 2004 (29.03.2004) EP

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(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:  
— with international search report

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: PROCESS FOR PREPARING A DAIRY-BASED SAUCE

(57) Abstract: A process for preparing a shelf-stable dairy-based sauce comprising oil/fat and a dairy component (e.g. cheese or cream), which sauce is low in reducing sugars, and wherein the composition, prior to packing, is not subjected to temperatures above 50°C.

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## PROCESS FOR PREPARING A DAIRY-BASED SAUCE

### Field of the invention

The present invention relates to a process for preparing a shelf stable dairy-based sauce.

- 5 Dairy-based sauces are sauces conventionally containing a dairy ingredient such as cheese and/or cream and/or butter.

### Background of the invention

- 10 Cheese sauces (i.e. emulsified sauces containing cheese and/or cheese flavour) and other dairy-based sauces such as cream-style sauces are popular e.g. with consumers having a western taste. Such sauces exist (apart from freshly made by consumer or chef, and disregarding dry sauce mixes) as fresh, chilled stable cheese sauces, pasteurised sauces or sterilised sauces.

- 15 DE 2058207 discloses cheese imitations and cheese imitation sauces comprising non-milk fat, milk protein, water, and optionally other components like emulsifier and stabiliser, but not containing any cheese, which products are prepared by mixing all ingredients, heat to about 60°C, pasteurise, and pack.

- 20 JP 3065543 discloses a seasoning sauce containing a milk material low in lactose. The products are prepared by mixing all ingredients, heated to about 85°C, pack and sterilise.

- JP 11225713 discloses a retort white sauce comprising milk, and which composition contains not more than 3% lactose. The composition is prepared by preparing a roux, adding milk,  
25 heating to 95-98°C, optionally adding flavourings and/or starch, packing in a pouch or can followed by a retort treatment.

- Fresh, chilled stable dairy-based sauces need to be stored in a cooling cabinet, and have a limited shelf life of a few weeks. Such sauces usually have a good quality (flavour, colour,  
30 mouthfeel).

Pasteurised sauces usually rely on minimal heating, and prevent the outgrowth or harmful organisms by e.g. acidification (a known technique for preservation of e.g. tomato sauces and dressings). Such acidification technique may be acceptable in tomato sauces or dressings, it

is less desired for cheese- or cream-style sauces, as the acidity does not combine very well with the overall desired taste profile of the cheese or cream-style sauces.

5 Sterilised dairy-based sauces rely on high temperature treatment for preservation, and may be shelf stable for several months at least. Such sauces suffer generally from off-taste and discoloration.

Chilled-stable dairy-based sauces are highly preferred over pasteurised and sterilised sauces, in particular regarding color and flavour, but are impractical in use due to the limited shelf life.

0 Thus, there is a need for shelf-stable dairy-based sauces having a good flavour, colour and mouthfeel. Preferably, such shelf-stable dairy-based sauces are more close to chilled stable dairy-based sauces regarding e.g. flavour and/or color and/or mouthfeel than existing shelf stable dairy-based sauces.

### 5 **Summary of the invention**

It was found that the above objectives can be met (at least in part) by a process for preparing a stable dairy-based sauce comprising fat and/or oil and a dairy component and wherein the sauce contains less than 2% of reducing sugars, which process involves the subsequent steps of:

- 10 (a) preparing a mixture containing all ingredients,  
(b) packing,

further comprising a sterilisation step prior to or after step (b), and wherein the mixture, prior to packing is not subjected to temperatures above 50°C (preferably not above 40°C).

15 Step (a) may optionally be divided up in partial steps. Step (a) preferably comprises a homogenisation treatment. If sterilisation is carried out prior to packing, this will have to be another type of sterilisation than by heating, as the temperature should, prior to packing, not exceed 50°C: e.g. ultra high pressure sterilisation may be employed.

20 In the process as set out above, it is preferred that between steps (a) and (b) the mixture is subjected to de-aerating. It is also preferred that the sterilisation is carried out by rotary sterilisation. Preferably the packed products are subjected to retort sterilisation.

The dairy-based sauce in the above process preferably comprises (all percentages as weight percentage of the sauce):

- 1-25% oil and/or fat,
- 1-20% of dairy component,
- 5 - 0.5-5% modified starch,
- 0.01-2% stabilising gum, preferably xanthan and/or carrageenan,
- 0.1-5% emulsifier, preferably egg yolk,
- 0.1-4% salt,
- 50-85% water,

10 wherein the sauce contains less than 2% of reducing sugars.

In the sauce according to the invention, it is preferred that the oil and/or fat is fairly stable against oxidation. In that respect, it was preferred that of the oil and fat present in the formulation the amount PUFA (triglycerides of polyunsaturated fatty acids) is below 60%, more preferably below 30% (wt% of total fatty acids in triglycerides) and amount of triglycerides of fatty acids having 10-14 carbon atoms (C10-C14) is below 25%, more preferably below 20% (wt% of total fatty acids in triglycerides). A certain amount of monounsaturated fatty acids is preferred however: preferably of the oil and fat present the amount MUFA (monounsaturated fatty acids) is above 30% (wt% of total fatty acids in triglycerides), preferably above 40%.

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20 Suitable oils and fats in this connection are e.g. olive oil, palm oil, butter fat, or mixtures thereof, and it is preferred that in the present composition 20-100% of the fat/oil is of the fats/oils specified.

#### **Detailed description of the invention**

25 In the formulations according to the invention, it is preferred that the sauce contains less than 1.5% reducing sugars, more preferably even less than 1% (weight % of total formulation). A typical reducing sugar present in conventional dairy components is lactose. Thus, it is preferred that the sauce according to the present invention is low in lactose. Consequently, it is preferred that part or all of the dairy component(s) in the formulations according to the invention are low-lactose dairy components. Preferably, the sauce according to the invention contains less than 1% lactose.

In the formulations according to the invention the dairy component may comprises cheese. Such cheese preferably comprises a low-lactose cheese. Preferred cheeses in this connection are (low lactose) parmesan, mozzarella, pecorino romano. In case cheese is present in the

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formulations according to the invention it is preferred that the formulation further comprising 0.05-2% of melting salts, preferably phosphates, phosphate salts, polyphosphates or mixtures thereof.

- 5 Next to or alternatively to cheese, the dairy component in the present invention may comprise comprises cream, single cream, whipping cream, double cream, soured cream, butter milk powder, caseinate, whey powder or mixtures thereof. Preferred in this connection are cream, whipping cream, or double cream, all containing at least 25% fat, preferably at least 35% fat.
- 10 It is preferred that the formulations according to the present invention contain less than 35% milk, preferably less than 25% milk, more preferably less than 15%. Preferably, the formulations are substantially free of milk.

- The formulations according to the present invention may further comprise flavourings and/or  
15 non-reducing sugars. The sauces according to the invention can be seen as oil-in-water emulsions.

#### **EXAMPLES**

A creamy cheese sauce was prepared having the following net composition:

- 20 8% olive oil  
0.4% xanthan gum  
1% egg yolk  
2% modified starch  
0.7% salt  
25 5% cheese (mixture of mascarpone, low lactose parmesan, pecorino)  
0.2% polyphosphate salt  
6% double cream  
balance water.

- 30 The sauce was prepared by mixing all ingredients except cheese and double cream, homogenise, adding the (grated) cheese and double cream, fill in glass jars (so far all at room temperature), followed by rotary sterilisation.

- The resulting product was a shelf-stable cheese sauce of good quality with a flavour and  
35 colour comparable to chilled stable cheese sauces.

**CLAIMS**

1. Process for preparing a stable dairy-based sauce comprising fat and/or oil and a dairy component and wherein the sauce contains less than 2% of reducing sugars, which process involves the subsequent steps of:
  - (a) preparing a mixture containing all ingredients,
  - (b) packing,further comprising a sterilisation step prior to or after step (b), and wherein the mixture, prior to packing is not subjected to temperatures above 50°C (preferably not above 40°C).
2. Process according to claim 1, wherein between steps (a) and (b) the mixture is subjected to de-aerating.
3. Process according to claim 1-2, wherein the sterilisation is carried out by rotary sterilisation.
4. Process according to claim 1-3, comprising (all percentages as weight percentage of the sauce):
  - 1-25% oil and/or fat,
  - 1-20% of dairy component,
  - 0.5-5% modified starch,
  - 0.01-2% stabilising gum, preferably xanthan and/or carrageenan,
  - 0.1-5% emulsifier, preferably egg yolk,
  - 0.1-4% salt,
  - 50-85% water,wherein the sauce contains less than 2% of reducing sugars.
5. Sauce according to claim 1-4, wherein the sauce contains less than 1.5% of reducing sugars.
6. Sauce according to claim 5, wherein the sauce contains less than 1% of reducing sugars.

7. Sauce according to claim 1-6, wherein the sauce contains less than 2%, preferably less than 1% of lactose.
8. Sauce according to claim 1-7, wherein the dairy component comprises cheese.
- 5 9. Sauce according to claim 8, wherein the cheese comprises (low lactose) parmesan, mozzarella, pecorino romano.
- 10 10. Sauce according to claim 8-9, further comprising 0.05-2% of melting salts, preferably phosphates, phosphate salts, polyphosphates or mixtures thereof.
11. Sauce according to claim 1-10, wherein the dairy component comprises cream, single cream, whipping cream, double cream, soured cream, butter milk powder, caseinate, whey powder or mixtures thereof.
- 15 12. Sauce according to claim 11, wherein the cream, whipping cream, or double cream contains at least 25% fat, preferably at least 35% fat.
- 20 13. Sauce according to claim 1-12, wherein of the oil and fat present the amount PUFA (triglycerides of polyunsaturated fatty acids) is below 60%, preferably below 30% (wt% of total fatty acids in triglycerides) and amount of triglycerides of fatty acids having 10-14 carbon atoms (C10-C14) is below 25%, preferably below 20% (wt% of total fatty acids in triglycerides).
- 25 14. Sauce according to claim 1-13, wherein of the oil and fat present the amount MUFA (triglycerides of monounsaturated fatty acids) is above 30% (wt% of total fatty acids in triglycerides, preferably above 40%).
- 30 15. Sauce according to claim 1-14, wherein the oil/fat comprises 20-100% (wt, based on total oil/fat content) olive oil, palm oil, butter fat, or mixtures thereof.
16. Sauce according to claim 1-15, wherein the sauce contains less than 35% milk, preferably less than 25% milk.

INTERNATIONAL SEARCH REPORT

International Application No  
PCT/EP2005/002373

**A. CLASSIFICATION OF SUBJECT MATTER**  
IPC 7 A23L1/24 A23L1/39

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)  
IPC 7 A23L

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)  
EPO-Internal, WPI Data, PAJ, FSTA

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

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X	US 4 689 239 A (RISPOLI ET AL) 25 August 1987 (1987-08-25) claim 1; examples 1-3	1,3,5-16
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Further documents are listed in the continuation of box C.       Patent family members are listed in annex.

° Special categories of cited documents :

<p>*A* document defining the general state of the art which is not considered to be of particular relevance</p> <p>*E* earlier document but published on or after the international filing date</p> <p>*L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>*O* document referring to an oral disclosure, use, exhibition or other means</p> <p>*P* document published prior to the international filing date but later than the priority date claimed</p>	<p>*T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>*X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone</p> <p>*Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.</p> <p>*Z* document member of the same patent family</p>
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Date of the actual completion of the international search  29 June 2005	Date of mailing of the international search report  08/07/2005
Name and mailing address of the ISA European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Authorized officer  Tallgren, A

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PCT/EP2005/002373

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PCT/EP2005/002373

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