

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
4 October 2007 (04.10.2007)

PCT

(10) International Publication Number
WO 2007/110181 A3

(51) International Patent Classification:
A23G 9/38 (2006.01) A23C 21/00 (2006.01)

(21) International Application Number:
PCT/EP2007/002494

(22) International Filing Date: 21 March 2007 (21.03.2007)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
06006298.1 27 March 2006 (27.03.2006) EP

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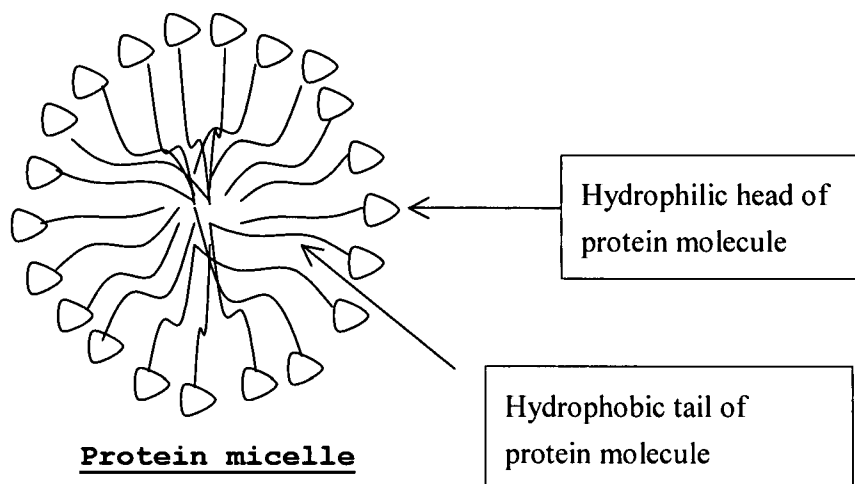
(81) Designated States (unless otherwise indicated, for every
kind of national protection available): AE, AG, AL, AM,
AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH,
CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES,
FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN,
IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR,
LS, LT, LU, LY, MA, MD, MG, MK, MN, MW, MX, MY,
MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS,
RU, SC, SD, SE, SG, SK, SL, SM, SV, SY, TJ, TM, TN,
TR, TT, TZ, UA, UG, US, UZ, VC, VN, 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, LV, MC, MT, 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
— before the expiration of the time limit for amending the
claims and to be republished in the event of receipt of
amendments

(88) Date of publication of the international search report:
10 April 2008

(54) Title: PROTEIN-ENRICHED FROZEN DESSERT



(57) Abstract: The present invention relates to nutritionally balanced frozen desserts, in particular to pasteurised frozen dessert having a high protein content and to a method for manufacturing them. Whey protein micelles, concentrates thereof and/or powders thereof can be used in the manufacture of frozen dessert.

WO 2007/110181 A3

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2007/002494

A. CLASSIFICATION OF SUBJECT MATTER
 INV. A23G9/38 A23C21/00

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)
 A23G A23C

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, FSTA, BIOSIS

C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 4 855 156 A (SINGER ET AL) 8 August 1989 (1989-08-08) claim 4 claim 11 example 5; tables 7,10	1-3, 30
X	EP 0 412 590 A (UNILEVER NV; UNILEVER PLC) 13 February 1991 (1991-02-13) claims 1,21; example 9 page 3, lines 43-45	1-3, 30
X	WO 93/07761 A (THE NUTRASWEET COMPANY) 29 April 1993 (1993-04-29) claims 1,6 page 5, lines 6-14 page 2, lines 6-13	1, 30
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<p>* Special categories of cited documents :</p> <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>"&" document member of the same patent family</p>	
Date of the actual completion of the international search 17 August 2007	Date of mailing of the international search report 19/02/2008
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 Groh, Björn

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2007/002494

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 4 107 334 A (JOLLY ET AL) 15 August 1978 (1978-08-15) example 15	1,30
X	YILSAY T Ö; YILMAZ L; BAYIZIT A A: "The effect of using a whey protein fat replacer on textural and sensory characteristics of low-fat vanilla ice cream" EUR FOOD RES TECHNOL, vol. 222, 2006, pages 171-175, XP002399301 [published online: 20 October 2005] table 1	1-3,30
X	US 6 767 575 B1 (HUSS MANFRED ET AL) 27 July 2004 (2004-07-27) cited in the application example 2	1,30
X	US 5 308 628 A (SCHOL COR J [NL] ET AL) 3 May 1994 (1994-05-03) cited in the application example 1	1,30
X	US 6 759 078 B2 (STUCHELL YVONNE M [US]) 6 July 2004 (2004-07-06) column 2, line 18 column 3, lines 1-17	1,30
X	PRINDIVILLE E A: "Effect of milk fat, cocoa butter and whey protein fat replacers on the sensory properties of lowfat and nonfat ice cream" J DAIRY SCI, vol. 83, 2000, pages 2216-2223, XP002435162 page 2216, column 2, lines 12-15; table 1	1,30
X	US 5 882 705 A (SATO KAORU [JP] ET AL) 16 March 1999 (1999-03-16) column 2, lines 49-65	1,30
X	US 6 673 384 B1 (VILLAGRAN FRANCISCO VALENTINO [US] ET AL) 6 January 2004 (2004-01-06) column 2, line 67 column 3, line 3 column 7, lines 39-44	1,30
X	EP 0 308 091 A (GEN MILLS INC [US]) 22 March 1989 (1989-03-22) page 6, lines 2,3 page 6, lines 38-45 tables 3,4 claims 6-14	1-3
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INTERNATIONAL SEARCH REPORT

International application No

PCT/EP2007/002494

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 1 281 322 A (WAGENINGEN CT FOR FOOD SCIENCE [NL]) 5 February 2003 (2003-02-05) claim 11 -----	1, 30
A	DE 203 00 380 U1 (THIEMANN ROLAND [DE]; WIERIG CHRISTOPH [DE]) 13 March 2003 (2003-03-13) page 2, lines 5,6; claim 2 -----	1
L	WO 01/64065 A1 (ADERANS KK [JP]; TAKARA CO LTD [JP]; SUGAI KATSUO [JP]; KAWARATANI YUK) 7 September 2001 (2001-09-07) [cited on p. 2 of application, however apparently not related to invention] abstract -----	

INTERNATIONAL SEARCH REPORT

International application No.
PCT/EP2007/002494

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. Claims Nos.: **5-29, 30(part), 31-39**
because they relate to subject matter not required to be searched by this Authority, namely:
Non-Unity objection (Rule 13.1 PCT), only first invention searched.
2. Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
3. Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. As all required additional search fees were timely paid by the applicant, this international search report covers allsearchable claims.
2. As all searchable claims could be searched without effort justifying an additional fees, this Authority did not invite payment of additional fees.
3. As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

see annex

Remark on Protest

- The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-4,30

frozen dessert comprising whey protein "micelles" and having a high protein content of 6, 8, 10% or more, and use of whey protein "micelles" in a frozen dessert.

2. claim: 5

frozen dessert wherein defined fractions of the total energy of the frozen dessert are provided by specific groups of ingredients (see claim 5).

3. claims: 6, 31

frozen dessert wherein the whey protein "micelles" constitute at least 50% of the total protein content, as defined in claims 6, and use of whey protein "micelles" according to claim 31.

4. claim: 7

frozen dessert with whey "micelles", which are provided in specific physical forms, as defined in claim 7.

5. claim: 8

frozen dessert with whey "micelles", which have an average size of 100 to 900 nm (see claim 8).

6. claim: 9

frozen dessert with whey "micelles", wherein the whey protein micelle powder has an average size of more than 1 μm , as defined in claim 9.

7. claim: 10

frozen dessert with whey "micelles", wherein the whey protein micelle powder is a carrier for an active ingredient as further defined in claim 10.

8. claim: 11

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

frozen dessert with whey "micelles", wherein the whey protein micelles or the powder thereof are coated with an emulsifier.

9. claim: 12

frozen dessert with whey "micelles", wherein the frozen dessert is a specific type of frozen dessert as stated in claim 12.

10. claims: 13,14

frozen dessert with whey "micelles", further characterized in that the frozen dessert is aerated, as defined in claims 13 or 14.

11. claims: 15,16

frozen dessert with whey "micelles", characterized by the type of fat used (e.g. milk fat or vegetable fat), see claims 15 and 16.

12. claim: 17

frozen dessert with whey "micelles", characterized in that it does not contain fat as defined in claim 17.

13. claim: 18

pasteurized frozen dessert with a high protein content (any type of suitable protein) according to claim 18.

14. claims: 19,21

pasteurized frozen dessert with a high protein content, the protein is 'essentially' whey, as defined in claims 19 or 21.

15. claim: 20

frozen dessert wherein the fat caloric value is less than 35% according to claim 20

16. claim: 22

pasteurized frozen dessert with a high protein content having a pH value between 6 and 8 as defined in claim 22.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

17. claim: 23

pasteurized frozen dessert with a high protein content positively comprising fat as defined in claim 23.

18. claim: 24

pasteurized frozen dessert with a high protein content wherein the whey protein is at least partially present as whey protein "micelles".

19. claims: 25,26,29

pasteurized frozen ice cream with at least 8% proteins, 15 to 28% carbohydrates and 3 to 7% fat, as defined in claims 25, or 26 or 29.

20. claim: 27 or 29

pasteurized frozen ice cream with at least 8% proteins, 15 to 28% carbohydrates and 3 to 7% fat, further defined by the carbohydrate content as stated in claim 27 or 29.

21. claim: 28 or 29

pasteurized frozen ice cream with at least 8% proteins, 15 to 28% carbohydrates and 3 to 7% fat, further defined by the fat content as stated in claims 28 or 29

22. claims: 32(part),33

process for the manufacture of a frozen dessert according to claim 32 or 33 (pasteurisation at neutral pH).

23. claims: 32(part),34

process for the manufacture of a frozen dessert according to claim 32 or 34 (pasteurisation at acidic pH).

24. claims: 32(part),35,39

process for the manufacture of a frozen dessert according to claim 32 or 35 or 39 (specified protein content).

25. claims: 32(part),36

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

process for the manufacture of a frozen dessert according to claim 32 or 36 (additional step of maturation).

26. claims: 32(part),37

process for the manufacture of a frozen dessert according to claim 32 or 37 (defined whey "micelle" diameter).

27. claims: 32(part),38

process for the manufacture of a frozen dessert according to claim 32 or 37 (defined protein powder size).

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/EP2007/002494

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 4855156	A	08-08-1989	NONE	
EP 0412590	A	13-02-1991	AU 6025290 A CA 2022921 A1 IE 902852 A1 JP 3087148 A	14-02-1991 11-02-1991 27-02-1991 11-04-1991
WO 9307761	A	29-04-1993	AU 2900192 A CA 2097316 A1 EP 0564640 A1 JP 6509475 T	21-05-1993 26-04-1993 13-10-1993 27-10-1994
US 4107334	A	15-08-1978	BE 859635 A1 CA 1094867 A1 DE 2745954 A1 DK 440977 A FI 772938 A FR 2367773 A1 GB 1536990 A IE 46114 B1 IT 1090503 B JP 53047560 A LU 78294 A1 NL 7710841 A NO 773156 A SE 7710423 A	12-04-1978 03-02-1981 20-04-1978 14-04-1978 14-04-1978 12-05-1978 29-12-1978 23-02-1983 26-06-1985 28-04-1978 01-06-1979 17-04-1978 14-04-1978 14-04-1978
US 6767575	B1	27-07-2004	AT 239381 T AU 3145600 A WO 0048473 A1 DE 19906379 A1 DE 19964370 B4 EP 1154700 A1	15-05-2003 04-09-2000 24-08-2000 17-08-2000 11-05-2006 21-11-2001
US 5308628	A	03-05-1994	NONE	
US 6759078	B2	06-07-2004	US 2003087001 A1	08-05-2003
US 5882705	A	16-03-1999	NONE	
US 6673384	B1	06-01-2004	NONE	
EP 0308091	A	22-03-1989	US 4840813 A	20-06-1989
EP 1281322	A	05-02-2003	AT 307489 T DE 60206926 D1 DE 60206926 T2 DK 1411779 T3 ES 2252487 T3 WO 03011040 A1	15-11-2005 01-12-2005 20-07-2006 06-03-2006 16-05-2006 13-02-2003
DE 20300380	U1	13-03-2003	NONE	
WO 0164065	A1	07-09-2001	CN 1450867 A EP 1275314 A1 TW 491695 B US 2003140934 A1	22-10-2003 15-01-2003 21-06-2002 31-07-2003