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BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, 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, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

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— *of inventorship (Rule 4.17(iv))*

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(88) Date of publication of the international search report:

23 January 2014

(54) Title: PROCESS FOR PRODUCING MALTOSE FROM STARCH

(57) Abstract: The present invention relates to a process for producing a syrup which is rich in maltose. The process is comprising the successive steps of liquefaction of a starch milk and saccharification of the liquefied starch milk in the presence of alpha-amylase, beta-amylase and a debranching enzyme selected from the group of pullulanase, iso-amylase and mixtures thereof, preferably pullulanase and further adding maltogenic alpha-amylase and/or iso-amylase, for obtaining a maltose containing syrup comprising at least 85% maltose based on dry matter and less than 1.5% glucose based on dry matter, preferably less than 1 % glucose based on dry matter.



WO 2013/114222 A3

# INTERNATIONAL SEARCH REPORT

International application No PCT/IB2013/000864
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<b>A. CLASSIFICATION OF SUBJECT MATTER</b> INV. C12P19/12      C12P19/14      C12P19/16      C12P19/22      C13K7/00 ADD.				
According to International Patent Classification (IPC) or to both national classification and IPC				
<b>B. FIELDS SEARCHED</b>				
Minimum documentation searched (classification system followed by classification symbols) C12P C13K				
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 practicable, search terms used) EPO-Internal, WPI Data, COMPENDEX, FSTA, BIOSIS, EMBASE				
<b>C. DOCUMENTS CONSIDERED TO BE RELEVANT</b>				
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.		
X	DATABASE WPI Week 200257 Thomson Scientific, London, GB; AN 2002-531597 XP002681976, -& JP 2002 101896 A (NIPPON SHIRYO KOGYO KK) 9 April 2002 (2002-04-09) abstract see patent document: * paragraph 24 * * paragraph 52 - paragraph 59 * * paragraph 83 * * paragraph 100 - paragraph 101; example 3 * <div style="text-align: center; margin-top: 10px;">----- -/--</div>	1-8		
<input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C. <input checked="" type="checkbox"/> See patent family annex.				
* Special categories of cited documents : <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; border: none; vertical-align: top;">                     "A" document defining the general state of the art which is not considered to be of particular relevance                      "E" earlier application or patent but published on or after the international filing date                      "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)                      "O" document referring to an oral disclosure, use, exhibition or other means                      "P" document published prior to the international filing date but later than the priority date claimed                 </td> <td style="width: 50%; border: none; vertical-align: top;">                     "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                      "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                      "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                      "&amp;" document member of the same patent family                 </td> </tr> </table>			"A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier application or patent but published on or after the international filing date "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) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed	"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 "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 "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 "&" document member of the same patent family
"A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier application or patent but published on or after the international filing date "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) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed	"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 "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 "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 "&" document member of the same patent family			
Date of the actual completion of the international search	Date of mailing of the international search report			
5 August 2013	25/10/2013			
Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Authorized officer  Fuchs, Ulrike			

# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/IB2013/000864

## 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.:  
because they relate to subject matter not required to be searched by this Authority, namely:
  
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 all searchable 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.:

1-8

### 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: 1-8

process for preparing a maltose containing syrup comprising the successive steps:

- a) carrying out liquefaction of a starch milk
- b) carrying out saccharification of the liquefied starch milk in the presence of alpha-amylase, beta-amylase and a debranching enzyme selected from the group of pullulanase, iso-amylase and mixtures thereof
- c) further adding maltogenic alpha-amylase and/or iso-amylase, for obtaining a maltose containing syrup comprising at least 85% maltose based on dry matter and less than 1.5% glucose based on dry matter, wherein in step b) the saccharification is taking place in presence of residual amount of alpha-amylase applied in the liquefaction of step a)

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2. claims: 9-13

maltose containing syrup comprising at least 85% maltose based on dry matter and less than 1.5% glucose based on dry matter and having a dry matter content of 25-75% and being obtained by the process according to anyone of claims 1 to 8

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INTERNATIONAL SEARCH REPORT

International application No  
PCT/IB2013/000864

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 6 346 400 B1 (CABOCHE, J.J.) 12 February 2002 (2002-02-12) cited in the application the whole document see especially: column 4, line 3 - line 7 -----	1-8
A	DE 19 35 330 A1 (HAYASHIBARA CO.) 1 October 1970 (1970-10-01) page 10, line 26 - page 12, line 12 page 30, line 1 - page 31, line 3 -----	1-8
A	US 5 198 120 A (MASUDA, T. ET AL.) 30 March 1993 (1993-03-30) column 1, line 1 - line 23 column 11 - column 13; figure 3; example 2; table 6 maltose fraction -----	1-8

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/IB2013/000864

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
JP 2002101896 A	09-04-2002	JP 3822465 B2 JP 2002101896 A	20-09-2006 09-04-2002
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US 6346400 B1	12-02-2002	AT 293703 T AU 6544199 A BR 9907436 A CA 2296198 A1 DE 69924821 D1 EP 1016728 A2 FR 2787809 A1 JP 2000189184 A KR 20000052608 A US 6346400 B1 US 2002055150 A1	15-05-2005 06-07-2000 24-04-2001 29-06-2000 25-05-2005 05-07-2000 30-06-2000 11-07-2000 25-08-2000 12-02-2002 09-05-2002
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