



(51) International Patent Classification:

C12N 1/18 (2006.01) C12C 11/00 (2006.01)
C12N 15/01 (2006.01) C12N 9/44 (2006.01)
C12N 15/04 (2006.01)

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(21) International Application Number:

PCT/DK2015/050413

(22) International Filing Date:

22 December 2015 (22.12.2015)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

PA 2014 70825 23 December 2014 (23.12.2014) DK
PA 2015 70351 8 June 2015 (08.06.2015) DK

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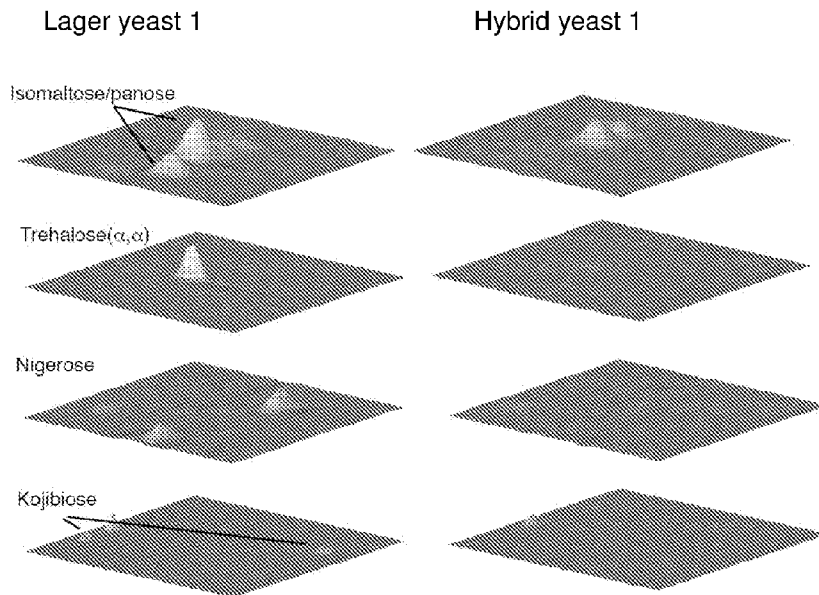
(81) Designated States

(unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, 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, IR, IS, JP, KE, KG, KN, KP, KR, KZ, LA, LC, LK, LR, LS, 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, SA, 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.

(71) Applicant: CARLSBERG BREWERIES A/S [DK/DK];
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[Continued on next page]

(54) Title: YEAST FOR PREPARING ALCOHOLIC BEVERAGES



(57) Abstract: The invention relates to yeast cells with useful characteristics, including being capable of utilizing panose as sole carbon source and/or capable of utilizing one or more dipeptides as sole nitrogen source. The invention also relates to yeast cells with useful genotypes including comprising at least 4 allelic genes encoding IMA1p and/or at least two allelic genes encoding IMA5p.

Fig. 4

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, ST, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).

Published:

- with international search report (Art. 21(3))
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))
- with sequence listing part of description (Rule 5.2(a))

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

18 August 2016

Declarations under Rule 4.17:

- of inventorship (Rule 4.17(iv))

INTERNATIONAL SEARCH REPORT

International application No
PCT/DK2015/050413

A. CLASSIFICATION OF SUBJECT MATTER
INV. C12N1/18 C12N15/01 C12N15/04 C12C11/00 C12N9/44
ADD.
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)
C12N C12C
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, BIOSIS, Sequence Search, FSTA, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 2012/177854 A2 (SYNGENTA PARTICIPATIONS AG [CH]; BORTIRI PEDRO ESTEBAN [US]; HALL RICH) 27 December 2012 (2012-12-27) the whole document examples 4,5 claims 14,16	1,15,33
X	CLAPPERTON J.F. ET AL: "FERMENTATION OF MINOR WORT CARBOHYDRATES BY BREWING YEASTS", JOURNAL OF THE INSTITUTE OF BREWING, vol. 77, no. 6, 12 November 1971 (1971-11-12), pages 519-522, XP055208294, ISSN: 0046-9750, DOI: 10.1002/j.2050-0416.1971.tb03415.x the whole document	1,2,15, 18,34,35

Further documents are listed in the continuation of Box C. See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance	"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
"E" earlier application or patent but published on or after the international filing date	"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
"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)	"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
"O" document referring to an oral disclosure, use, exhibition or other means	"&" document member of the same patent family
"P" document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search 21 June 2016	Date of mailing of the international search report 30/06/2016
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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 van de Kamp, Mart
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INTERNATIONAL SEARCH REPORT

International application No

PCT/DK2015/050413

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
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INTERNATIONAL SEARCH REPORT

International application No
PCT/DK2015/050413

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Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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INTERNATIONAL SEARCH REPORT

International application No
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C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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A	----- YASUSHI HIRAOKA ET AL: "Inner nuclear membrane protein Imal is dispensable for intranuclear positioning of centromeres", GENES TO CELLS, vol. 16, no. 10, 1 September 2011 (2011-09-01), pages 1000-1011, XP055282048, GB ISSN: 1356-9597, DOI: 10.1111/j.1365-2443.2011.01544.x the whole document	27
T	----- MARIT H. ET AL: "S. cerevisiae x S. eubayanus interspecific hybrid, the best of both worlds and beyond", FEMS YEAST RESEARCH, vol. 15, no. 3, 5 March 2015 (2015-03-05), page fov005, XP008177238, ISSN: 1567-1356, DOI: 10.1093/FEMSYR/FOV005 the whole document ----- -/--	

INTERNATIONAL SEARCH REPORT

International application No
PCT/DK2015/050413

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
T	<p>KRISTOFFER K. ET AL: "New lager yeast strains generated by interspecific hybridization", JOURNAL OF INDUSTRIAL MICROBIOLOGY AND BIOTECHNOLOGY, vol. 42, no. 5, 15 February 2015 (2015-02-15), pages 769-778, XP035480650, ISSN: 1367-5435, DOI: 10.1007/S10295-015-1597-6 the whole document -----</p>	

INTERNATIONAL SEARCH REPORT

International application No.
PCT/DK2015/050413

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.:

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: 1-26(completely); 28-35(partially)

A yeast cell having at least one of the following characteristics: II. capable of utilizing panose as sole carbon source; III. capable of utilizing one or more dipeptides as sole nitrogen source. A method for producing a beverage, said method comprising the steps of a. providing a starting liquid, b. providing a yeast cell according to any one of claims 1 and 2 to 26 and 28 to 33 dependent thereon, c. fermenting said starting liquid with said yeast cell, thereby producing a beverage.

2. claims: 27(completely); 28-35(partially)

A yeast cell having the genotype: IV. comprising at least 3 genes, such as at least 4 genes encoding IMA1p. A method for producing a beverage, said method comprising the steps of a. providing a starting liquid, b. providing a yeast cell according to any one of claims 27 and 28 to 33 dependent thereon, c. fermenting said starting liquid with said yeast cell, thereby producing a beverage.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/DK2015/050413

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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