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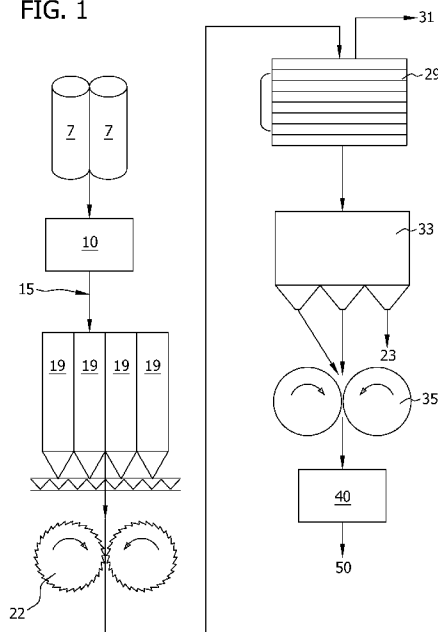
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[Continued on next page]

(54) Title: FLOUR SUPPLEMENT COMPOSITIONS AND METHODS FOR PREPARING WHEAT FLOUR

FIG. 1



(57) Abstract: The present disclosure is directed to flour supplement compositions that contain transglutaminase and an amino acid selected from lysine, glutamine or a combination thereof. Additionally, the present disclosure is directed to flour-based food compositions or foodstuffs (e.g., breads, pastas, noodles, etc.) prepared with the supplement. The present disclosure is still further directed to methods for preparing wheat flour compositions by adding the supplement or alternatively by adding an amino acid selected from lysine, glutamine or a combination thereof and transglutaminase to flour used therein.

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- *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))*

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2010/037980**A. CLASSIFICATION OF SUBJECT MATTER****A23L 1/10(2006.01)i, A23L 1/16(2006.01)i, A21D 2/26(2006.01)i**

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)

A23L 1/10; G06F 15/16; H04J 3/22; H04B 7/02

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

Korean utility models and applications for utility models

Japanese utility models and applications for utility models

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

eKOMPASS(KIPO internal) & Keywords: "flour, transglutaminase, lysine, glutamine, amino acid, wheat, bread, noodle, protein, gluten, etc."

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 6106887 A1 (KATSUTOSHI YAMAZAKI and TAKAHIKO SOEDA, JP) 22 August 2000 See the whole document	1-4,63-71,93-98 ,147-152,227-234
X	US 6383533 B1 (TAKAHIKO SOEDA et al., JP) 07 May 2002 See the whole document	1-4,63-71,93-98 ,147-152,227-234
A	MARK DUBE et al. 'Texturisation and modification of vegetable proteins for food applications using microbial transaminase.' In: European Food Research and Technology. June 2007, Vol.225(2), pp.287-299. See the whole document	1-4,63-71,93-98 ,147-152,227-234
A	M. MOTOKI and K. SEGURO 'Transglutaminase and its use for food processing.' In: Trends in Food Science & Technology. May 1998, Vol.9(5), pp.204-210. See the whole document	1-4,63-71,93-98 ,147-152,227-234
A	JIANPING WU and HAROLD CORKE 'Quality of dried white salted noodles affected by microbial transglutaminase.' In: Journal of the Science of Food and Agriculture. December 2005, Vol.85(15), pp.2587-2594. See the whole document	1-4,63-71,93-98 ,147-152,227-234

☒ 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

"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 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

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/US2010/037980**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.: See below
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:
Claims Nos.: 28, 29, 59, 60-62, 114, 131, 168, 200-207, 211-218, 219-226, 261
See Extra Sheet (No.1)
3. ☒ Claims Nos.: See Extra Sheet (No.2)
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:

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 fee, this Authority did not invite payment of any additional fee.
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.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US2010/037980

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	C. -S. TSENG and H. -M. LAI 'Physicochemical properties of wheat flour dough modified by microbial transglutaminase.' In: Journal of Food Science. March 2002, Vol.67(2), pp.750-755. See the whole document	1-4,63-71,93-98 ,147-152,227-234
A	H. J. AHN et al. 'Functional and thermal properties of wheat, barley, and soy flours and their blends treated with a modified transglutaminase.' In: Journal of Food Science. August 2005, Vol.70(6), pp.c380-c386. See the whole document	1-4,63-71,93-98 ,147-152,227-234
A	STEFANO RENZETTI et al. 'Microstructure, fundamental rheology and baking characteristics of batters and breads from different gluten-free flours treated with a microbial transglutaminase.' In: Journal of Cereal Science. July 2008, Vol.48(1), pp.33-45. See the whole document	1-4,63-71,93-98 ,147-152,227-234

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/US2010/037980

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 6106887 A1	22.08.2000	AU 1997-45283 B2 CN 1183903 C0 EP 0847701 B1 JP 03-582265 B2	23.03.2000 10.06.1998 17.07.2002 27.10.2004
US 6383533 B1	07.05.2002	AU 1999-32239 B2 BR 9901797 A CA 2273771-A1 CN 100413419 C0 DE 69940387 D1 EP 0963704 B1 JP 03-702709 B2	05.06.2003 16.05.2000 09.12.1999 27.08.2008 26.03.2009 11.02.2009 05.10.2005

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US2010/037980

No. 1

- Claims 28, 29, 59, 60-62, 114, 131, 168, and 261 are unclear, because they quote multiple dependent claims [PCT Rule 6.4(a)].
- Claims 200-207, 211-218, and 219-226 broadly define the feature of 'bread' in terms of 'having a volume to weight ratio of ...' and 'having a volume...'. However, the description conveys the impression that this feature can only be carried out in a particular way, namely by adding a transglutaminase and amino acids such as lysine and glutamine to flours for bread preparation, and no alternative means are envisaged. Thus said claims are too broad to make meaningful search.

No. 2

- Claims Nos.: 5-27, 30-58, 72-92, 99-113, 115-130, 132-146, 153-167, 169-199, 208-210, 235-260, 262-274.
- Said claims do not comply with PCT Rule 6.4(a), because multiple dependent claims should not serve as a basis for any other multiple dependent claim.