

PCT

WORLD INTELLECTU
Inter

INTERNATIONAL APPLICATION PUBLISHED



(51) International Patent Classification ⁶ :

C12N 9/64

A3

WO 9529999A3

(21) International Application Number: PCT/DK95/00171

(22) International Filing Date: 25 April 1995 (25.04.95)

(30) Priority Data:
0505/94 3 May 1994 (03.05.94) DK

(71) Applicant (for all designated States except US): CHR.
HANSEN A/S [DK/DK]; Bøge Allé 10-12, P.O. Box 407,
DK-2970 Hørsholm (DK).

(72) Inventors; and

(75) Inventors/Applicants (for US only): LARSEN, Robert
[DK/DK]; Hasselvej 32, DK-2830 Virum (DK). HARBOE,
Marianne, Kirsten [DK/DK]; Kulsviervvej 149, DK-2800
Lyngby (DK). LADSTEN, Pål, Martin [NO/DK]; 4th
floor, Kastelsvej 22, DK-2100 Copenhagen Ø (DK).

(74) Agent: PLOUGMANN & VINGTOFT A/S; Sankt Annæ Plads
11, P.O. Box 3007, DK-1021 Copenhagen K (DK).

(81) Designated States: AM, AT, AT (Utility model), AU, BB,
BG, BR, BY, CA, CH, CN, CZ, CZ (Utility model), DE,
DE (Utility model), DK, DK (Utility model), EE, ES, FI, FI
(Utility model), GB, GE, HU, IS, JP, KE, KG, KP, KR, KZ,
LK, LR, LT, LU, LV, MD, MG, MN, MW, MX, NO, NZ,
PL, PT, RO, RU, SD, SE, SG, SI, SK, SK (Utility model),
TJ, TM, TT, UA, US, UZ, VN, European patent (AT, BE,
CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT,
SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML,
MR, NE, SN, TD, TG), ARIPO patent (KE, MW, SD, SZ,
UG).

Published

With international search report.

*Before the expiration of the time limit for amending the
claims and to be republished in the event of the receipt of
amendments.*

(88) Date of publication of the international search report:
8 February 1996 (08.02.96)

(54) Title: A PROCESS FOR SEPARATING MILK CLOTTING ENZYMES, AND STABLE RENNET COMPOSITIONS

(57) Abstract

A process of separating milk clotting enzymes in extracts of animal stomach tissue which comprises contacting a partially purified extract with an ion exchange resin under conditions where chymosin is bound to the resin and recovering the chymosin, the process optionally comprising the further step of recovering pepsin, from a pepsin-rich extract fraction using an ion exchange resin, and a liquid or powdered rennet composition containing at least 90 % of its milk clotting activity as chymosin activity, the composition comprising a chymosin stabilizing agent which is typically selected from a protein, a peptide, an amino acid or ascorbic acid.

FOR THE PURPOSES OF INFORMATION ONLY

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AT	Austria	GB	United Kingdom	MR	Mauritania
AU	Australia	GE	Georgia	MW	Malawi
BB	Barbados	GN	Guinea	NE	Niger
BE	Belgium	GR	Greece	NL	Netherlands
BF	Burkina Faso	HU	Hungary	NO	Norway
BG	Bulgaria	IE	Ireland	NZ	New Zealand
BJ	Benin	IT	Italy	PL	Poland
BR	Brazil	JP	Japan	PT	Portugal
BY	Belarus	KE	Kenya	RO	Romania
CA	Canada	KG	Kyrgyzstan	RU	Russian Federation
CF	Central African Republic	KP	Democratic People's Republic of Korea	SD	Sudan
CG	Congo	KR	Republic of Korea	SE	Sweden
CH	Switzerland	KZ	Kazakhstan	SI	Slovenia
CI	Côte d'Ivoire	LI	Liechtenstein	SK	Slovakia
CM	Cameroon	LK	Sri Lanka	SN	Senegal
CN	China	LU	Luxembourg	TD	Chad
CS	Czechoslovakia	LV	Latvia	TG	Togo
CZ	Czech Republic	MC	Monaco	TJ	Tajikistan
DE	Germany	MD	Republic of Moldova	TT	Trinidad and Tobago
DK	Denmark	MG	Madagascar	UA	Ukraine
ES	Spain	ML	Mali	US	United States of America
FI	Finland	MN	Mongolia	UZ	Uzbekistan
FR	France			VN	Viet Nam
GA	Gabon				

INTERNATIONAL SEARCH REPORT

 Internat: Application No
 PCT/DK 95/00171

 A. CLASSIFICATION OF SUBJECT MATTER
 IPC 6 C12N9/64

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 6 C12N

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)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	GB,A,2 106 521 (NOVO INDUSTRI A/S) 13 April 1983 cited in the application	30-48
Y	see the whole document ---	14, 15
Y	WO,A,90 15866 (GENENCOR INTERNATIONAL) 27 December 1990 cited in the application see page 16 - page 17, paragraph 3 see page 19, paragraph 2 - page 20 ---	1-8, 10-29
Y	EP,A,0 137 710 (GENEX CORPORATION) 17 April 1985 see the whole document ---	1-8, 10-29
	--- -/--	

☒ Further documents are listed in the continuation of box C.☒ Patent family members are listed in 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 document 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

4 December 1995

Date of mailing of the international search report

14. 12. 95

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

Van der Schaal, C

INTERNATIONAL SEARCH REPORT

Internat. Application No
PCT/DK 95/00171

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	WO,A,88 02220 (SANOFI BIO INGREDIENTS) 7 April 1988 cited in the application see the whole document ---	28
A	PREPARATIVE BIOCHEMISTRY, vol. 17, no. 3, pages 297-312, S. SUBRAMANIAN 'Separation of chymosin and pepsin in calf rennet by dye-ligand affinity chromatography' -----	1

INTERNATIONAL SEARCH REPORT

International application No.

PCT/DK95/00171

Box I Observations where certain claims were found unsearchable (Continuation of item 1 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 II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

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

- claims 1-29: A process of separating milk clotting aspartic endopeptidases present in an extract of animal stomach tissue
- claims 30-48: Stabilized chymosin preparations

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.
- ☒ No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

Information on patent family members

Internat. Application No

PCT/DK 95/00171

Patent document cited in search report	Publication date	Patent family member(s)	Publication date	
GB-A-2106521	13-04-83	BE-A-	894447	21-03-83
		DE-A-	3234761	05-05-83
		FR-A, B	2522681	09-09-83
		NL-A-	8203631	18-04-83
		US-A-	4455375	19-06-84

WO-A-9015866	27-12-90	AT-T-	126531	15-09-95
		AU-B-	624968	25-06-92
		AU-B-	5842190	08-01-91
		AU-B-	624969	25-06-92
		AU-B-	5842790	08-01-91
		CA-A-	2058934	14-12-90
		CA-A, C	2058948	14-12-90
		DE-D-	69021729	21-09-95
		EP-A-	0477284	01-04-92
		EP-A-	0477285	01-04-92
		JP-T-	5500602	12-02-93
		JP-T-	5500603	12-02-93
		WO-A-	9015864	27-12-90
		US-A-	5151358	29-09-92
		US-A-	5139943	18-08-92

EP-A-0137710	17-04-85	US-A-	4721673	26-01-88
		JP-A-	60070074	20-04-85

WO-A-8802220	07-04-88	US-A-	4745063	17-05-88
		AU-B-	605221	10-01-91
		AU-B-	8278387	21-04-88
		CA-A-	1286620	23-07-91
		DE-A-	3780809	03-09-92
		EP-A, B	0288554	02-11-88
		IE-B-	60464	13-07-94
