



(43) International Publication Date
22 November 2012 (22.11.2012)

(10) International Publication Number
WO 2012/156242 A3

(51) International Patent Classification:

C08J 9/08 (2006.01) C08J 9/06 (2006.01)
C08J 9/10 (2006.01) C08J 9/36 (2006.01)

(21) International Application Number:

PCT/EP2012/058498

(22) International Filing Date:

9 May 2012 (09.05.2012)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

61/487,305 18 May 2011 (18.05.2011) US

(71) Applicant (for all designated States except US): **BASF SE** [DE/DE]; 67056 Ludwigshafen (DE).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **ZIEMER, Antje** [DE/DE]; Wolframstr. 3, 68199 Mannheim (DE). **KOW-ALSKI, Anna** [DE/DE]; Ernst-Barlach-Str.5, 67227 Frankenthal (DE). **BAUER, Ernst Jürgen** [DE/DE]; Londoner Ring 68, 67069 Ludwigshafen (DE). **BRUHNS, Stefan** [DE/DE]; Eschenhof 91, 68305 Mannheim (DE).

(74) Common Representative: **BASF SE**; 67056 Ludwigshafen (DE).

(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, 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, 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, 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.

(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, 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, 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))

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

14 November 2013



WO 2012/156242 A3

(54) Title: PRODUCTION OF A SUPERABSORBENT FOAM OF HIGH SWELL RATE

(57) Abstract: This invention relates to a process for producing superabsorbent foams comprising the steps of foaming an aqueous mixture comprising at least one monoethylenically unsaturated monomer bearing acid groups, at least one blowing agent, at least one crosslinker and at least one surfactant, polymerizing the foamed mixture and drying the polymerized mixture, to the foams and also to their use for absorbing aqueous fluids.

INTERNATIONAL SEARCH REPORT

| |
|---|
| International application No PCT/EP2012/058498 |
|---|

| | | | | |
|---|--|-----------------------|--|--|
| A. CLASSIFICATION OF SUBJECT MATTER INV. C08J9/08 C08J9/10 C08J9/06 C08J9/36 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) C08J | | | | |
| 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 | | | | |
| C. DOCUMENTS CONSIDERED TO BE RELEVANT | | | | |
| Category* | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. | | |
| A | US 2009/045138 A1 (BASF AG) 19 February 2009 (2009-02-19) cited in the application paragraphs [0001], [0006], [0010] - [0016], [0020], [0045], [0090], [0093], [0095], [0100], [0105], [0107] - [0109], [0115] paragraphs [0116], [0124], [0128] examples ----- | 1-10 | | |
| X | EP 0 827 753 A2 (NIPPON SHOKUBAI CO., LTD.) 11 March 1998 (1998-03-11) page 3, lines 11-15,18-19,33-36,40-43,51-56 page 4, line 53 - page 5, lines 8,18-39 page 6, lines 53-57 page 11, line 52 - page 12, line 13 claims 1,3,8-11; examples ----- -/-- | 1-10 | | |
| <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 "&" 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 | | | |
| 21 January 2013 | 26/09/2013 | | | |
| 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 Duval, Monica | | | |

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2012/058498

| 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 5 118 719 A (NALCO CHEMICAL COMPANY) 2 June 1992 (1992-06-02) column 1, lines 7-16 column 2, lines 23-65 column 3, lines 30-34 column 4, lines 11-15,30-38 column 5, lines 7-17,30-51 column 6, lines 4-21 examples | 1-10 |
| A | ----- US 6 136 873 A (BASF AG) 24 October 2000 (2000-10-24) the whole document ----- | 1-10 |

INTERNATIONAL SEARCH REPORT

International application No.
PCT/EP2012/058498

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.:

1-10

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: 1-10

method of producing a superabsorbent foam and the foam
obtained by the process

2. claims: 11-17

superabsorbent foam and its use

INTERNATIONAL SEARCH REPORT

Information on patent family members

| |
|---|
| International application No PCT/EP2012/058498 |
|---|

| Patent document cited in search report | Publication date | Patent family member(s) | Publication date | | | |
|--|------------------|-------------------------|-----------------------------|---|------------|---------------------------|
| US 2009045138 | A1 | 19-02-2009 | AT 353673 T 15-03-2007 | | | |
| | | | AU 2003271685 A1 04-05-2004 | | | |
| | | | CN 1711112 A 21-12-2005 | | | |
| | | | DE 10247241 A1 22-04-2004 | | | |
| | | | EP 1562650 A2 17-08-2005 | | | |
| | | | JP 4886190 B2 29-02-2012 | | | |
| | | | JP 2006503134 A 26-01-2006 | | | |
| | | | KR 20050071558 A 07-07-2005 | | | |
| | | | US 2006020049 A1 26-01-2006 | | | |
| | | | US 2009045138 A1 19-02-2009 | | | |
| | | | WO 2004035668 A2 29-04-2004 | | | |
| | | | ZA 200503680 A 26-07-2006 | | | |
| ----- | | | | | | |
| EP 0827753 | A2 | 11-03-1998 | CN 1179433 A 22-04-1998 | | | |
| | | | CN 1475517 A 18-02-2004 | | | |
| | | | DE 69724052 D1 18-09-2003 | | | |
| | | | DE 69724052 T2 17-06-2004 | | | |
| | | | EP 0827753 A2 11-03-1998 | | | |
| | | | EP 1374919 A2 02-01-2004 | | | |
| | | | ID 18077 A 26-02-1998 | | | |
| | | | US 6107358 A 22-08-2000 | | | |
| | | | ----- | | | |
| | | | US 5118719 | A | 02-06-1992 | DE 69230964 D1 31-05-2000 |
| DE 69230964 T2 09-11-2000 | | | | | | |
| EP 0538983 A1 28-04-1993 | | | | | | |
| JP 3280077 B2 30-04-2002 | | | | | | |
| JP H05237378 A 17-09-1993 | | | | | | |
| US 5118719 A 02-06-1992 | | | | | | |
| ----- | | | | | | |
| US 6136873 | A | 24-10-2000 | DE 19540951 A1 07-05-1997 | | | |
| | | | DE 59604255 D1 24-02-2000 | | | |
| | | | EP 0858478 A1 19-08-1998 | | | |
| | | | ES 2142623 T3 16-04-2000 | | | |
| | | | JP 3976785 B2 19-09-2007 | | | |
| | | | JP H11514691 A 14-12-1999 | | | |
| | | | US 6136873 A 24-10-2000 | | | |
| | | | WO 9717397 A1 15-05-1997 | | | |
| ----- | | | | | | |