

(19) World Intellectual Property Organization  
International Bureau



(43) International Publication Date  
2 August 2007 (02.08.2007)

PCT

(10) International Publication Number  
**WO 2007/087128 A3**

(51) International Patent Classification:

**C08F 220/06** (2006.01) **A61L 15/00** (2006.01)  
**D04H 1/64** (2006.01)

(21) International Application Number:

PCT/US2007/000172

(22) International Filing Date: 3 January 2007 (03.01.2007)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:

11/339,216 25 January 2006 (25.01.2006) US

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(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, 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, LV, LY, MA, MD, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, SV, SY, 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, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

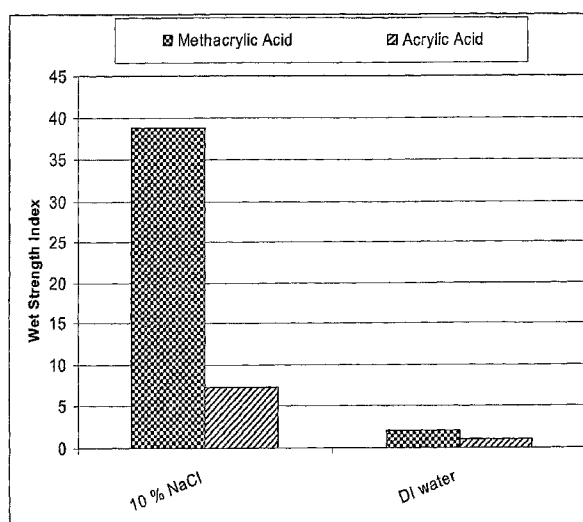
Published:

- with international search report
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

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

24 April 2008

(54) Title: SALT-SENSITIVE BINDERS FOR NONWOVEN WEBS AND METHOD OF MAKING SAME



(57) Abstract: A solution with a salt-sensitive polymer binder for use in fibrous webs, where the binder contains a copolymer of carboxylic acid monomer units and ethylenically unsaturated monomer units. The binder solution is prepared by emulsion-polymerizing a copolymer and then neutralizing the copolymer with base to make it water soluble. The binders provide a higher wet strength in concentrated salt solutions than in deionized water, and are particularly suitable for strengthening nonwoven fibrous webs in disposable articles such; as wet-wipes, personal care products, diapers, and the like.

WO 2007/087128 A3

# INTERNATIONAL SEARCH REPORT

International application No

PCT/US2007/000172

## A. CLASSIFICATION OF SUBJECT MATTER

INV. C08F220/06 D04H1/64 A61L15/00

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)

C08F D04H C08L A61L

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)

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.
X	<p>US 6 063 857 A (GREENBLATT GARY DAVID [US] ET AL) 16 May 2000 (2000-05-16) cited in the application</p> <p>example 10 tables 1-3 column 1, lines 7-15 column 2, lines 14-20 column 4, lines 7-49 column 4, lines 28-32; claim 7 column 2, line 56 - column 3, line 39 example 1 column 2, line 56 - column 3, line 55</p> <p style="text-align: center;">----- -/--</p>	<p>1-6, 9, 10, 13, 17-24, 27-38, 41, 44-51</p>



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 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

6 December 2007

Date of mailing of the international search report

06/03/2008

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## INTERNATIONAL SEARCH REPORT

International application No.

PCT/US2007/000172

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	<p>EP 0 646 606 A (ROHM &amp; HAAS [US]) 5 April 1995 (1995-04-05)</p> <p>column 6, lines 37-56 column 8, lines 20-29 column 4, lines 17-20 column 8, line 28 column 6, lines 18-28</p>	<p>1, 2, 4, 18-20, 23, 24, 39, 41, 44, 45, 47-51</p>
X	<p>US 4 384 096 A (SONNABEND LAWRENCE F) 17 May 1983 (1983-05-17) cited in the application</p> <p>example 2 column 2, lines 57-63 column 3, line 26 - column 5, line 12 column 7, line 40 - column 8, line 2 figure 1</p>	<p>1, 2, 4-6, 18-28, 32-41, 44-51</p>
X	<p>US 5 739 196 A (JENKINS RICHARD DUANE [US] ET AL) 14 April 1998 (1998-04-14)</p> <p>example J1 column 2, lines 52-55 column 3, line 13 - column 4, line 29 column 3, lines 29, 30 column 5, lines 3-18</p>	<p>9, 10, 13, 14, 16-20, 23, 24, 27-38, 41-43, 47-51</p>
X	<p>WO 01/74941 A (NAT STARCH &amp; CHEMICAL COMPANY [US]) 11 October 2001 (2001-10-11)</p> <p>table p.59 page 26, line 20 - page 27, line 12 example 9 page 19 table p.50</p>	<p>9-20, 23-25, 27-38, 41, 47-51</p>
A	<p>US 5 053 448 A (TSAUR SHENG-LIANG [US]) 1 October 1991 (1991-10-01) cited in the application example 1 figure 1 column 3, lines 4-30 column 6, lines 16-20</p>	<p>1-6, 9-51</p>

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# INTERNATIONAL SEARCH REPORT

International application No

PCT/US2007/000172

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	<p>EP 0 931 795 A (NIPPON CARBIDE KOGYO KK [JP]) 28 July 1999 (1999-07-28) example 1 paragraphs [0001], [0077], [0085] paragraphs [0005], [0021], [0028], [0037], [0052], [0059], [0066], [0078] -----</p>	1-6, 9-51

# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US2007/000172

## 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 - 6, 9 - 51

### 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/SA/ 210**

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-6,9-51

A method for producing a polymeric solution of a salt sensitive binder polymer composition.  
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2. claims: 7-8

A method to make a nonwoven web using the above polymeric binder through a specific process.  
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3. claims: 52-54

A disposable article with a nonwoven web including a salt sensitive polymeric binder as above.  
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# INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2007/000172

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 6063857	A	16-05-2000	NONE	
EP 0646606	A	05-04-1995	AU 678221 B2	22-05-1997
			AU 6305194 A	13-04-1995
			CA 2122977 A1	05-04-1995
			DE 69406522 D1	04-12-1997
			DE 69406522 T2	04-06-1998
			JP 7216025 A	15-08-1995
			US 5326843 A	05-07-1994
US 4384096	A	17-05-1983	NONE	
US 5739196	A	14-04-1998	NONE	
WO 0174941	A	11-10-2001	AU 4596001 A	15-10-2001
			EP 1274791 A1	15-01-2003
			TW 548309 B	21-08-2003
			US 6683129 B1	27-01-2004
			US 2004186222 A1	23-09-2004
US 5053448	A	01-10-1991	AR 244247 A1	29-10-1993
			AT 113968 T	15-11-1994
			AU 5923790 A	22-02-1991
			CA 2063423 A1	22-01-1991
			DE 69014120 D1	15-12-1994
			DE 69014120 T2	18-05-1995
			DK 482027 T3	24-04-1995
			EP 0482027 A1	29-04-1992
			ES 2063364 T3	01-01-1995
			JP 2790259 B2	27-08-1998
			JP 5500376 T	28-01-1993
			MX 171052 B	27-09-1993
			NZ 233994 A	29-01-1992
			PH 28325 A	16-06-1994
			WO 9101336 A1	07-02-1991
			US 5073591 A	17-12-1991
EP 0931795	A	28-07-1999	CA 2268301 A1	23-04-1998
			WO 9816561 A1	23-04-1998
			JP 3390991 B2	31-03-2003
			US 6197907 B1	06-03-2001