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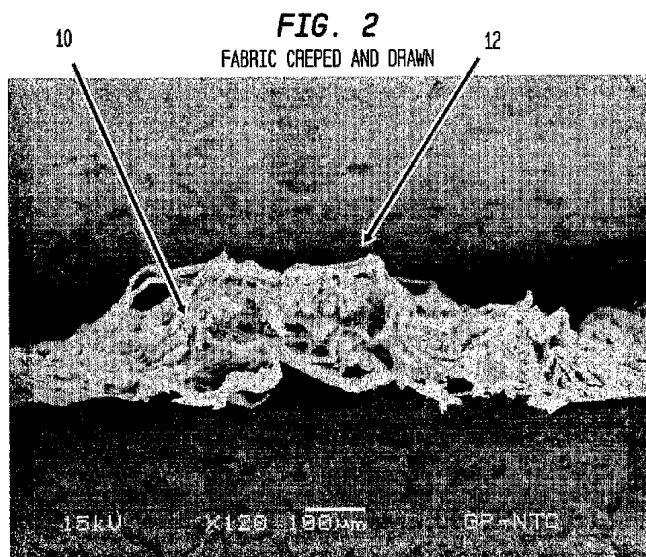
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[Continued on next page]

(54) Title: FABRIC CREPE/DRAW PROCESS FOR PRODUCING ABSORBENT SHEET



(57) Abstract: A method of making a fabric-creped absorbent cellulosic sheet comprising: a) compactively dewatering a paper-making furnish to form a nascent web having an apparently random distribution of papermaking fiber; b) applying the dewatered web having the apparently random fiber distribution to a translating transfer surface moving at a first speed; c) fabric-creping the web from the transfer surface at a consistency of from about 30 to about 60 percent utilizing a patterned creping fabric, the creping step occurring under pressure in a fabric creping nip defined between the transfer surface and the creping fabric wherein the fabric is traveling at a second speed slower than the speed of said transfer surface, the fabric pattern, nip parameters, velocity delta and web consistency being selected such that the web is creped from the transfer surface and redistributed on the creping fabric to form a web with a drawable reticulum.

WO 2006/113025 A3

**Declarations under Rule 4.17:**

- *as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))*
- *as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))*

**Published:**

- *with international search report*

**(88) Date of publication of the international search report:**  
23 April 2009

## INTERNATIONAL SEARCH REPORT

International application No.

PCT/US2006/010132

## A. CLASSIFICATION OF SUBJECT MATTER

Int. Cl. **B31F 1/16** (2006.01) **D21F 11/00** (2006.01)

US CL. 264/283 162/111

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)

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)

DWPI: B31F 1/ D21F 11/ crepe creping speed revolve velocity rpm rate dewater dehydrate

Espace: ECLA class B31F 1/12F, D21F 11/00E and speed velocity rpm rate crepe

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
P, X	US 2005/0217814 A1 (SUPER et al) 6 October 2005 Entire document	1-90
P, X	US 2005/0241787 A1 (MURRAY et al) 3 November 2005 Entire document	1-90
A X, Y	US 4440597 A (WELLS et al) 3 April 1984 Column 7, Claims	67 79-90

☒ 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 December 2007

Date of mailing of the international search report

**20 MAR 2008**

Name and mailing address of the ISA/US

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Commissioner for Patents

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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.
A	US 4849054 A (KLOWAK) 18 July 1989 Column 4 lines 12 to 60, column 5 line 40 to column 6 line 25, column 7 lines 53 to column 8 line 7, column 8 lines 26 to 47.	1, 13, 35, 50 ,62
X, Y Y		67-78 79-90
A	US 4356059 A (HOSTETLER) 26 October 1982 Column 1 line 57 to column 2 line 17	1, 13, 35, 50 ,62 79-90
Y		
X A X, Y Y	US 2004/0238135 A1 (EDWARDS et al) 2 December 2004 Entire document	1, 5-12 13, 35, 50, 62 79-90 67-78
A	WO 1997/043484 A1 (KIMBERLY-CLARK WORLDWIDE, INC.) 20 November 1997 Entire document, especially page 10	1, 13, 35, 50, 62
P, A	US 2005/0241786 A1 (EDWARDS et al) 3 November 2005 Claims	67-78
P, A	US 2005/0279471 A1 (MURRAY et al) 22 December 2005 Claims	67, 79, 87
P, A	US 2006/0000567 A1 (MURRAY et al) 5 January 2006 Entire document	1, 13, 35, 50 ,62

**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 Extra 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 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.

**Supplemental Box**

(To be used when the space in any of Boxes I to VIII is not sufficient)

**Continuation of Box No: Box III**

This International Application does not comply with the requirements of unity of invention because it does not relate to one invention or to a group of inventions so linked as to form a single general inventive concept.

In assessing whether there is more than one invention claimed, I have given consideration to those features which can be considered to potentially distinguish the claimed combination of features from the prior art. Where different claims have different distinguishing features they define different inventions.

This International Searching Authority has found that there are different inventions as follows:

- Claims 1 to 66, including independent claims 1, 13, 35, 50 and 62, define methods of making fabric-creped absorbent cellulosic sheets characterised by a papermaking furnish being compactively dewatered to form a dewatered web; a fabric creping surface travels at a speed slower than a transfer surface that carries the dewatered web; the fabric creping results in a drawable reticulum that is able to increase its void volume when dried and subsequently drawn. It is considered that compactively dewatering, forming a drawable reticulum and subsequently drawing the dried reticulum to increase voids volume comprises a first distinguishing feature.
- Claims 67 to 78, including independent claim 67, also defines a method of making It is considered that treating the creped web with a vacuum to increase the CD stretch comprises a second distinguishing feature.
- Claims 79 to 90, including independent claims 79 and 87, also define methods of making of making

PCT Rule 13.2, first sentence, states that unity of invention is only fulfilled when there is a technical relationship among the claimed inventions involving one or more of the same or corresponding special technical features. PCT Rule 13.2, second sentence, defines a special technical feature as a feature which makes a contribution over the prior art.

The only feature common to all of the claims is compactive dewatering of the papermaking furnish and fabric creping the dewatered web with a creping surface that is travelling at a slower speed than a transfer surface. However this common feature is generic in the art. This means that the common feature cannot constitute a special technical feature within the meaning of PCT Rule 13.2, second sentence, since it makes no contribution over the prior art.

Because the common feature does not satisfy the requirement for being a special technical feature it follows that it cannot provide the necessary technical relationship between the identified inventions. Therefore the claims do not satisfy the requirement of unity of invention *a posteriori*.

## INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/US2006/010132

This Annex lists the known "A" publication level patent family members relating to the patent documents cited in the above-mentioned international search report. These particulars are merely given for the purpose of information.

Patent Document Cited in Search Report				Patent Family Member			
US	2005217814	AU	2003279792	CA	2501329	CA	2559343
		CA	2559526	CN	1723318	CN	1942626
		CN	1942627	EP	1556548	EP	1735496
		EP	1763608	NO	20065220	RU	2005113241
		US	2004238135	US	2005241786	US	2005241787
		WO	2004033793	WO	2005103375	WO	2005106117
		WO	2006113025				
US	4440597	CA	1222406				
US	4849054						
US	4356059	CA	1183709	US	4420372		
US	2004238135	AU	2003279792	CA	2501329	CA	2559343
		CA	2559526	CN	1723318	CN	1942626
		CN	1942627	EP	1556548	EP	1735496
		EP	1763608	NO	20065220	RU	2005113241
		US	2005217814	US	2005241786	US	2005241787
		WO	2004033793	WO	2005103375	WO	2005106117
		WO	2006113025				
WO	9743484	AU	12901/99	AU	12924/99	AU	13700/99
		AU	29919/97	BR	9709083	BR	9813335
		BR	9815204	BR	9815233	CA	2252695
		CA	2306962	CA	2307675	CA	2309076
		CN	1282393	CN	1282394	CN	1282396
		EP	0907797	EP	1027495	EP	1027496
		EP	1027497	EP	1295986	ID	25451
		ID	28749	KR	2000001102	US	6080279
		US	6083346	US	6093284	US	6096169
		US	6143135	US	6228220	US	6306257
		WO	9923300	WO	9923301	WO	9923302
		ZA	9704113	ZA	9809273	ZA	9809730
		ZA	9809733	AU	2003279792	CA	2501329
		CA	2559343	CA	2559526	CN	1723318
		CN	1942626	CN	1942627	EP	1556548

### Information on patent family members

PCT/US2006/010132

		EP	1735496	EP	1763608	NO	20065220
		RU	2005113241	US	2004238135	US	2005217814
		US	2005241786	US	2005241787	WO	2004033793
		WO	2005103375	WO	2005106117	WO	2006113025
US	2005279471	CA	2579738	EP	1756359	WO	2006009833
US	2006000567	CA	2568996	EP	1761671	WO	2006007517
END OF ANNEX							