

REVISED VERSION

(19) World Intellectual Property  
Organization  
International Bureau



(10) International Publication Number  
**WO 2013/046060 A9**

(43) International Publication Date  
4 April 2013 (04.04.2013)

(51) International Patent Classification:

*D21H 17/33* (2006.01)      *D21H 21/18* (2006.01)  
*D21H 17/55* (2006.01)      *D21H 21/20* (2006.01)  
*D21H 17/56* (2006.01)      *D21H 23/04* (2006.01)  
*D21H 17/00* (2006.01)

ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI,  
NO, NZ, OM, PA, 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.

(21) International Application Number:

PCT/IB20 12/002822

(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).

(22) International Filing Date:

26 September 2012 (26.09.2012)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

61/541,717 30 September 2011 (30.09.2011) US

Declarations under Rule 4.17:

(71) Applicant: **KEMIRA OYJ** [FI/FI]; Porkkalankatu 3, FI-  
00180 Helsinki (FI).

— as to applicant's entitlement to apply for and be granted a  
patent (Rule 4.17(H))

(72) Inventors: **LUO, Yuping**; 430 Arborshade Trace, Duluth,  
GA 30097 (US). **GRIGORIEV, Vladimir**; 939 Virginia  
Circle, NE, Atlanta, GA 30306 (US). **LU, Chen**; 1218  
Promontory Path, Marietta, GA 30062 (US). **ROSEN-  
CRANCE, Scott**; 4000 Landmark Drive, Douglasville, FL  
30135 (US).

— as to the applicant's entitlement to claim the priority of the  
earlier application (Rule 4.17(in))

Published:

(74) Agent: **BERGGREN OY AB**; P.O. Box 16, (Antinkatu 3  
C), FI-00101 Helsinki (FI).

— 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))

(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, BN, 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,

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

11 July 2013

(15) Information about Correction:

see Notice of 11 July 2013



WO 2013/046060 ^ 9

(54) Title: PAPER AND METHODS OF MAKING PAPER

(57) Abstract: Exemplary embodiments of the present disclosure include paper, methods of making paper, and the like.

# INTERNATIONAL SEARCH REPORT

International application No <b>PCT/IB2012/002822</b>
--

A. CLASSIFICATION OF SUBJECT MATTER  
**INV. D21H17/33 D21H17/55 D21H17/56 D21H17/00 D21H21/18**  
**D21H21/20 D21H23/04**

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)  
**D21H**

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**

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	wo 99/50500 AI (CALLAWAY CORP [US] ) 7 October 1999 (1999-10-07) page 3, line 24 - page 8, line 8; claims 1-9; examples 1,2 -----	1-31
Y	US 5 427 652 A (DARLINGTON WILLIAM B [US] ET AL) 27 June 1995 (1995-06-27) the whole document -----	1-31
Y	US 2009/165978 AI (HAGIOPOL CORNEL [US] ET AL) 2 July 2009 (2009-07-02) paragraphs [0012] - [0044] ; claims 1-26; examples 2-9 -----	1-31
Y	wo 95/21298 AI (MEAD CORP [US] ) 10 August 1995 (1995-08-10) the whole document -----	1-31
	-/- .	

Further documents are listed in the continuation of Box C.       See patent family annex.

\* Special categories of cited documents :

<p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier application or patent but published on or after the international filing date</p> <p>"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)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p>	<p>"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</p> <p>"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</p> <p>"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</p> <p>"&amp;" document member of the same patent family</p>
---	---

Date of the actual completion of the international search <b>30 April 2013</b>	Date of mailing of the international search report <b>13/05/2013</b>
---	---

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  <b>Chinda, Evangelia</b>
--	--

## INTERNATIONAL SEARCH REPORT

International application No

PCT/IB2012/002822

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 5 674 362 A (UNDERWOOD RICHARD T [US] ET AL) 7 October 1997 (1997-10-07) the whole document -----	1-31
Y	US 6 429 267 B1 (RI EHLE RICHARD JAMES [US]) 6 August 2002 (2002-08-06) column 1, line 56 - column 2, line 3 claim 1; examples 1-29; tables 1-9 -----	1-31

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No <b>PCT/IB2012/002822</b>
--

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
wo 9950500 <b>AI</b>	07-10-1999	AU 3217399 <b>A</b>	18-10-1999
		US 6077394 <b>A</b>	20-06-2000
		wo 9950500 <b>AI</b>	07-10-1999
-----			
us 5427652 <b>A</b>	27-06- 1995	US 5427652 <b>A</b>	27-06-1995
		US 5466337 <b>A</b>	14-11-1995
		wo 9521297 <b>AI</b>	10-08-1995
-----			
us 2009165978 <b>AI</b>	02-07- 2009	CA 2744334 <b>AI</b>	27-05-2010
		EP 2358941 <b>AI</b>	24-08-2011
		US 2009165978 <b>AI</b>	02-07-2009
		wo 2010059946 <b>AI</b>	27-05-2010
-----			
wo 9521298 <b>AI</b>	10-08- 1995	AU 1742995 <b>A</b>	21-08-1995
		wo 9521298 <b>AI</b>	10-08-1995
-----			
us 5674362 <b>A</b>	07-10- 1997	AU 2269097 <b>A</b>	02-09-1997
		ID 19107 <b>A</b>	18-06-1998
		US 5674362 <b>A</b>	07-10-1997
		wo 9730221 <b>AI</b>	21-08-1997
		ZA 9701229 <b>A</b>	25-08-1997
-----			
us 6429267 <b>BI</b>	06-08- 2002	us 6429267 <b>BI</b>	06-08-2002
		ZA 9900021 <b>A</b>	02-07-1999
-----			