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(74) Common Representative: Agfa Graphics NV; IP Department 3622, Septestraat 27, B-2640 Mortsel (BE).

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(54) Title: RADIATION CURABLE INKJET PRINTING METHODS

(57) Abstract: A radiation curable inkjet printing method for producing printed flexible foils and plastic bags including the steps of: a) providing a web-like polymeric substrate having a maximum value for $\tan \delta$ between 40°C and 110°C; b) providing a single pass inkjet printer having at least one page-wide printhead or at least one set of staggered printheads, means for transporting the web-like recording medium and curing means; c) jetting onto the web-like polymeric substrate having a surface energy S_{sub} , a non-aqueous radiation curable inkjet liquid having a surface tension S_{Liq} , wherein S_{Liq} is smaller than S_{sub} by at least 4 mN/m; and d) curing the radiation curable liquid on the substrate at a surface temperature equal or higher than the temperature of the maximum value for $\tan \delta$ and smaller than the melting point of the polymeric recording medium wherein the maximum value for $\tan \delta$ is determined by dynamic mechanical analysis at a temperature ramp of 3°C/min using forced oscillation with a cycle of 1 second and an amplitude of 100 μ m. A single pass inkjet printer is also disclosed.



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INTERNATIONAL SEARCH REPORT

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According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

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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.
Y	EP 1 652 686 A (AGFA GEVAERT [BE]) 3 May 2006 (2006-05-03) paragraphs [0044], [0047]; claim 1; example 2	1-13
Y	WO 99/29788 A (XAAR TECH LTD [GB]; JOHNSON STEVE [GB]; WOODS JILL [GB]) 17 June 1999 (1999-06-17) page 14, lines 16-23; claims 1,11; example 1 page 21, line 17 - page 22, line 4	1-13
Y	EP 1 832 633 A (FUJIFILM CORP [JP]) 12 September 2007 (2007-09-12) paragraphs [0196], [0199] - [0022]; claims 1,8,10,11; example 2	1-13
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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.
Y	US 2007/182796 A1 (OHKUBO KENICHI [JP] ET AL) 9 August 2007 (2007-08-09) paragraphs [0045], [0076]; claims 1-3,12,13 -----	1-13

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No PCT/EP2008/064018

Patent document cited in search report	Publication date	Patent family member(s)	Publication date	
EP 1652686	A	03-05-2006	AT 399094 T CN 1765636 A JP 2006137185 A	15-07-2008 03-05-2006 01-06-2006
WO 9929788	A	17-06-1999	AU 1346399 A GB 2346889 A	28-06-1999 23-08-2000
EP 1832633	A	12-09-2007	JP 2007231206 A US 2007206045 A1	13-09-2007 06-09-2007
US 2007182796	A1	09-08-2007	JP 2007211081 A	23-08-2007