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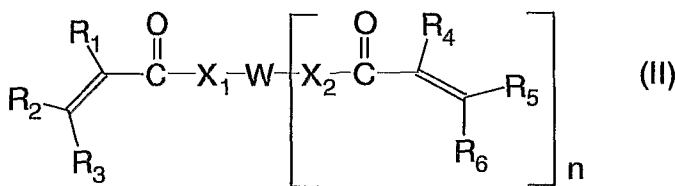
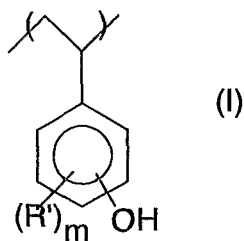
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(54) Title: NEGATIVE PHOTORESIST COMPOSITIONS



(57) Abstract: The present invention relates to a negative photoresist composition comprising, a) at least one alkali-soluble polymer, where the polymer comprises at least one unit of structure (I), where, R' is selected independently from hydrogen, (C₁-C₄)alkyl, chlorine, bromine and m is an integer from 1 to 4; b) at least one monomer of structure (II), where, W is a multivalent linking group, R₁ to R₆ are independently selected from hydrogen, hydroxyl, (C₁-C₂₀) alkyl and chlorine, X₁ and X₂ are independently oxygen or N-R₇, where R₇ is hydrogen or (C₁-C₂₀) alkyl, and n is and integer equal to or greater than 1, and c) at least one photoinitiator. The invention also relates to a process for imaging the negative photoresist composition.

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INTERNATIONAL SEARCH REPORT

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<p>A. CLASSIFICATION OF SUBJECT MATTER INV. G03F7/027 G03F7/033</p>		
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<p>B. FIELDS SEARCHED</p>		
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<p>C. DOCUMENTS CONSIDERED TO BE RELEVANT</p>		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	JP 2002 229208 A (TOPPAN PRINTING CO LTD) 14 August 2002 (2002-08-14)	1,4,5,7, 8,11, 15-19, 22,23
Y	page 8, paragraph 47; example 1; table 1	2,3,6,9, 12-14, 20,21
Y	----- US 2004/142280 A1 (IWANAGA SHIN-ICHIRO [JP] ET AL) 22 July 2004 (2004-07-22) page 3, paragraph 44 page 12, paragraph 295 page 13; examples 4,5; table 2 ----- -/--	2,3,6,9, 12-14, 20,21
<p><input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C. <input checked="" type="checkbox"/> See patent family annex.</p>		
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C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
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X	EP 1 150 165 A (JSR CORP [JP]) 31 October 2001 (2001-10-31) page 16, paragraph 153 - paragraph 154; example 1 -----	1,4,7,8, 10,11, 15-19, 22,23

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Information on patent family members

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Patent document cited in search report		Publication date	Patent family member(s)	Publication date
JP 2002229208	A	14-08-2002	NONE	
US 2004142280	A1	22-07-2004	AU 2002367625 A1 CN 1509424 A EP 1477848 A1 WO 03069410 A1 JP 2003241372 A	04-09-2003 30-06-2004 17-11-2004 21-08-2003 27-08-2003
EP 1150165	A	31-10-2001	TW 574600 B US 2001044075 A1	01-02-2004 22-11-2001