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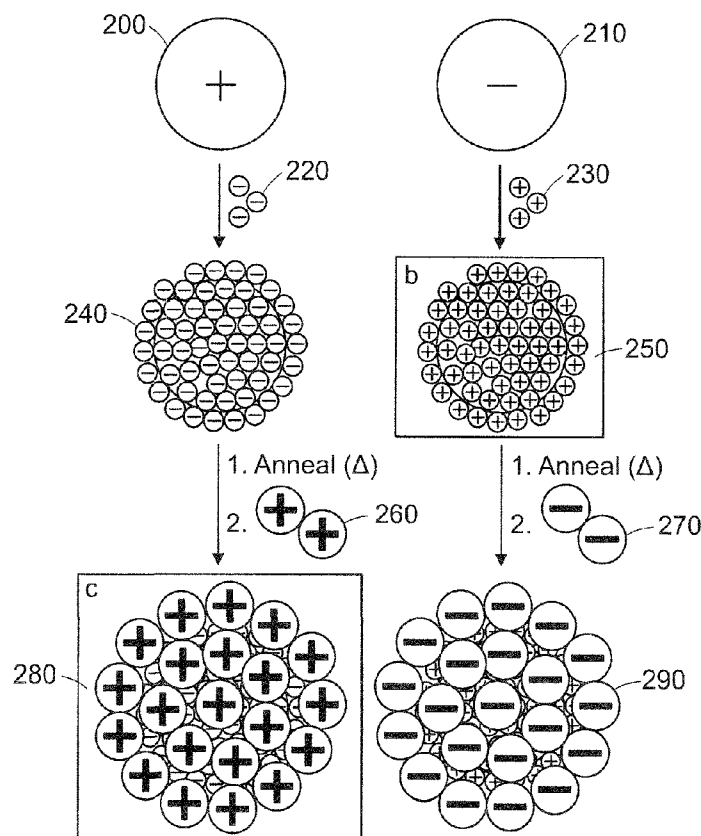
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(54) Title: CHEMICALLY-DIRECTED ELECTROSTATIC SELF-ASSEMBLY OF MATERIALS



(57) Abstract: A self-assembled article includes a surface comprising a chemical functionality having an immobilized charge; and a plurality of particles assembled on the surface of the core, said particles having a surface comprising an immobilized chemical functionality of a charge opposite that of the core.

FIG. 2



PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM,
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A. CLASSIFICATION OF SUBJECT MATTER
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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)

B05D B01J

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)

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C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No
X	US 2004/038007 A1 (KOTOV NICHOLAS A [US] ET AL) 26 February 2004 (2004-02-26)	1, 2, 5, 9, 10, 12-16, 18-21, 23, 28-30, 34-36, 40 27, 41
A	the whole document	
X	JP 2003 094546 A (DAINIPPON PRINTING CO LTD) 3 April 2003 (2003-04-03)	1, 3-5, 10, 24-26, 28, 29, 31, 37-40
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(^Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with Indication, where appropriate of the relevant passages	Relevant to cla/m No
X	WO 01/78906 A (VIRGINIA TECH INTELL PROP [US]; SPILLMAN WILLIAM B JR [US]; WANG YOU X) 25 October 2001 (2001-10-25) the whole document -----	5, 9, 15, 18-20, 22, 28, 34-40

INTERNATIONAL SEARCH REPORT

Information on patent family members

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2004038007 A1	26-02-2004	NONE	
JP 2003094546 A	03-04-2003	NONE	
WO 0178906 A	25-10-2001	AU 5344201 A CA 2405242 A1 EP 1280613 A1 JP 2003530926 T	30-10-2001 25-10-2001 05-02-2003 21-10-2003