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WO 2014/140430 A3

(54) Title: MULTI SHELL METAL PARTICLES AND USES THEREOF

(57) Abstract: A composition comprising a plurality of coated metal particles with a metal core surrounded by nested shells formed by an electrically conductive layer and by a barrier layer, at least one of the shells being formed by electroless plating. The invention also comprises a method of producing such compositions as well as the use of the composition in, for example, crystalline- silicon solar cell devices having contact structures formed on one or more surfaces of a solar cell device, such as those used in back contact solar cell devices or emitter wrap through (EWT) solar cell devices.

INTERNATIONAL SEARCH REPORT

International application No PCT/FI2014/050194

A. CLASSIFICATION OF SUBJECT MATTER INV. C23C18/16 C23C18/18 H01L21/283 B22F1/02 C09D11/52 C23C18/36 C23C18/52 ADD. C23C18/44 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) C23C C09D H01L G02F B22F 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, WPI Data				
C. DOCUMENTS CONSIDERED TO BE RELEVANT				
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.		
X	JP 2002 075057 A (MITSUI MINING & SMELTING CO) 15 March 2002 (2002-03-15)	1-4, 6-10, 12-14, 21,41		
Y	abstract; examples 1-7 -----	11,42,43		
X	WO 2006/080289 A1 (SEKISUI CHEMICAL CO LTD [JP]; KUBOTA TAKASHI [JP]) 3 August 2006 (2006-08-03) cited in the application the whole document ----- -/--	1-5,7, 10,12, 14,18, 19,23,41		
<input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C. <input checked="" type="checkbox"/> See patent family annex.				
* Special categories of cited documents : <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; border: none; vertical-align: top;"> "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier application or patent but published on or after the international filing date "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) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed </td> <td style="width: 50%; border: none; vertical-align: top;"> "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 "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 "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 "&" document member of the same patent family </td> </tr> </table>			"A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier application or patent but published on or after the international filing date "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) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed	"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 "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 "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 "&" document member of the same patent family
"A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier application or patent but published on or after the international filing date "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) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed	"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 "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 "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 "&" document member of the same patent family			
Date of the actual completion of the international search	Date of mailing of the international search report			
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INTERNATIONAL SEARCH REPORT

International application No
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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.
X	US 2005/227074 A1 (OYAMADA MASAOKI [JP] ET AL) 13 October 2005 (2005-10-13) paragraph [0023] - paragraph [0047]; claims 1,2 paragraph [0071] - paragraph [0072] abstract -----	1,10,12, 15-17, 20,22, 24-27
Y	US 2013/029886 A1 (MAZYAR OLEG A [US] ET AL) 31 January 2013 (2013-01-31) paragraph [0036]; claim 12 -----	11,43
Y	WO 2011/102659 A2 (DUK SAN TEKOPIA CO LTD [KR]; JANG YONG UN [KR]; JANG SEUNG JUN [KR]; J) 25 August 2011 (2011-08-25) abstract -----	42

INTERNATIONAL SEARCH REPORT

International application No.
PCT/FI2014/050194

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 additional 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 an 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.:

1-27, 41-43

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.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-27, 41-43

Composition comprising multi shell core particles.
Corresponding method to prepare said composition.

2. claims: 28-32, 37-39, 44, 45

A conductive paste for producing electrically conductive lines and coatings.

3. claims: 33-36

A conductive paste or ink for producing a light receiving surface electrode. Corresponding method.

4. claim: 40

A method for producing a a conductive and adhesive electromagnetic interference coating.

5. claims: 46-48

A semiconductor component comprising conductive layers with multi shell core particles.

6. claim: 49

An electromagnetic interference shield comprising composite material with multi shell core particles.

7. claim: 50

An anti-counterfeiting tag comprising composite material with multi shell core particles.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No PCT/FI2014/050194

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
JP 2002075057 A	15-03-2002	JP 4864195 B2 JP 2002075057 A	01-02-2012 15-03-2002
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