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(54) **Title:** CHROME-FREE COATING COMPOSITIONS FOR SURFACE-TREATING STEEL SHEET INCLUDING CARBON NANOTUBE, METHODS FOR SURFACE-TREATING STEEL SHEET AND SURFACE-TREATED STEEL SHEETS USING THE SAME

(57) **Abstract:** There are provided a chrome-free coating composition for surface-treating a hot-dip galvanized steel sheet including carbon nanotube that is distributed in a water-dispersible urethane resin, and a surface-treated steel sheet using the same. The chrome-free coating composition for surface-treating a hot-dip galvanized steel sheet that include carbon nanotube and has excellent electric conductivity, comprising, based on the total solid weight of the composition: (a) 40 to 60 parts by weight of a water-soluble or water-borne organic resin; (b) 20 to 40 parts by weight of an inorganic metallic sol; (c) 2 to 5 parts by weight of a carbon nanotube paste including carbon nanotube (CNT); (d) 2 to 5 parts by weight of a metal oxide/phosphate-based anti-corrosion agent; (e) 5 to 15 parts by weight of an organic metal complex; (f) 3 to 7 parts by weight of a carbodimide crosslinking agent, and (g) the balance of water, ethanol or a mixture thereof. The steel sheet surface-treated with the composition may be useful to secure the corrosion resistance without including a chrome component and show its electric conductivity even when the coating composition is used at a coating amount of 1000 mg/m² or more.

INTERNATIONAL SEARCH REPORT

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PCT/KR2008/007625**A. CLASSIFICATION OF SUBJECT MATTER***C23C 22/00(2006.01)i, C23C 2/06(2006.01)i*

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)

IPC C23C, C09D, H01B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Korean utility models and applications for utility models since 1975

Japanese utility models and applications for utility models since 1975

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

eKOMPASS(KIPO internal)

Keywords: chrome-free, coating, carbon, nanotube, paste, composition

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	KR 10-0728468 B1 (DONGBU STEEL CO., LTD.) 13 June 2007 See abstract, all tables, and all claims	1-14
A	KR 10-0628031 B1 (NANOTECH. CO., LTD.) 26 September 2006 See abstract and all claims	1-14
A	US 07279247 B2 (OLGA MATARREDONA et al.) 09 October 2007 See abstract and all claims	1-14
A	US 2006/0090818 A1 (WILLIAM S. CAREY et al.) 04 May 2006 See abstract and all claims	1-14

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

* Special categories of cited documents:

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"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

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"&" document member of the same patent family

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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
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KR 10-0628031 B1	26.09.2006	EP 1911042 A1 EP 1911042 A4 JP 2009-502567 A US 2008-0193767 A1 WO 2007-013705 A1	16.04.2008 29.10.2008 29.01.2009 14.08.2008 01.02.2007
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