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(71) Applicants:
• **Rexsteel Inc.**
Gyeongsangnam-do 52052 (KR)

• **Daehan Corrugated Steel Pipe Co.**
Gyeongsangnam-do 52052 (KR)

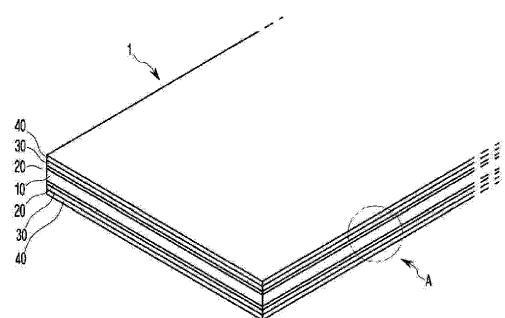
(72) Inventors:
• **Lee, Sun Woo**
52052 Gyeongsangnam-do (KR)
• **Lee, Yun Ji**
52052 Gyeongsangnam-do (KR)

(74) Representative: **Zacco Sweden AB**
P.O. Box 5581
Löjtnantsgatan 21
114 85 Stockholm (SE)

(54) **SURFACE TREATMENT METHOD OF GALVANIZED STEEL SHEET PRODUCT AND GALVANIZED STEEL SHEET PRODUCT TREATED BY THE SAME**

(57) There is disclosed a surface treatment method of a steel sheet formed product including a first step of preparing a galvanized steel sheet formed product; a second step of performing surface-modification treatment for a galvanized layer of the prepared steel sheet formed product; a third step of coating a resin on the surface-modification-treated galvanized layer; and a fourth step of bring the resin coating layer into close contact on the galvanized layer. The second step may include a process of increasing a surface roughness by electrolytically etching the galvanized steel sheet formed product in a surface treatment composition solution. The surface treatment composition may be an eco-friendly baking soda solution, and the baking soda solution may be prepared by dissolving 10wt% to 50wt% of baking soda in water. The electrolytic corrosion may be performed by using the galvanized steel sheet formed product as an anode and lead or copper as a cathode, and the electrolytic corrosion may be performed by a voltage of 10V to 36V DC at a temperature of 60°C to 85°C. The third step may perform a process of re-coating a resin by general coating once or twice or more on the base steel sheet coated with a resin by a first electrodeposition coating.

FIG. 1



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EUROPEAN SEARCH REPORT

Application Number

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EPO FORM 1503 03.82 (P04C01)

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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Y	* the whole document * -----	2 - 5	C23C18/08 C25D9/02
Y	US 2013/243975 A1 (NAGOSHI MASAYASU [JP] ET AL) 19 September 2013 (2013-09-19) * the whole document * -----	2 - 5	C25D13/04 C25D13/20 C25D13/22 B05D3/00
			TECHNICAL FIELDS SEARCHED (IPC)
			C25F C23D C23C B05D
-The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 19 July 2024	Examiner Ritter, Thomas
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	



Application Number

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CLAIMS INCURRING FEES

The present European patent application comprised at the time of filing claims for which payment was due.

☐ Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due and for those claims for which claims fees have been paid, namely claim(s):

☐ No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due.

LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

see sheet B

☐ All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.

☐ As all searchable claims could be searched without effort justifying an additional fee, the Search Division did not invite payment of any additional fee.

☐ Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:

☒ None of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:

2-5 (completely); 1, 11, 12, 15 (partially)

☐ The present supplementary European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims (Rule 164 (1) EPC).

**LACK OF UNITY OF INVENTION
SHEET B**

Application Number

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The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

1. claims: 2-5 (completely); 1, 11, 12, 15 (partially)

Method and product obtained thereby: prepare galvanized steel sheet formed product; etching electrolytically, coating a resin; and bringing into close contact. The electrolytic etching is in a baking soda solution.

2. claims: 6, 7 (completely); 1, 11, 12, 15 (partially)

Method and product obtained thereby: prepare galvanized steel sheet formed product; etching electrolytically, coating a resin; and bringing into close contact. After the electrolytic etching, before the resin coating, a coating in a zirconium compound solution is performed.

3. claims: 8-10, 13, 14 (completely); 1, 11, 12, 15 (partially)

Method and product obtained thereby: prepare galvanized steel sheet formed product; etching electrolytically, coating a resin; and bringing into close contact. The resin coating is an electrodeposition coating.

ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.

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5 This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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19-07-2024

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