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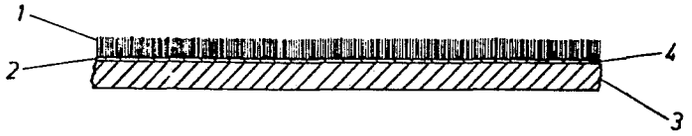
(54) **An anti-corrosive treatment method for sheet steel and similar articles.**

(57) An anti-corrosive treatment method primarily intended for application in cars, boats and building constructions. According to the method a layer of flocking fibers (1) is applied to the surface (4) to be protected and secured thereto by means of a soft adhesive (2). The adhesive preferably is an acrylic dispersion adhesive.



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An anti-corrosive treatment method for sheet steel and similar articles

The subject invention concerns an anti-corrosive treatment method for sheet steel, particularly for application in cars, boats, ships and building constructions.

Prior-art anti-corrosive treatment methods used for cars suffer from a number of disadvantages. The prior-art anti-corrosive protection layers have a very limited life, and the treatment therefore must be repeated at regular intervals during the serviceable life of the car itself, usually once a year. The extra costs that car owner incur by the necessity of such frequent treatments are quite considerable. In addition, the protective effect of the treatments is limited, since none of the treatment methods known provides complete rust protection. In addition, the majority of the anti-rust preparations used hitherto are tacky and consequently messy to work with. Grit and other particles also easily adhere to the applied layer.

The purpose of the subject invention is to provide a novel anti-corrosive treatment, which is particularly suitable for sheet steel for cars and which does not suffer from any of the drawbacks outlined above.

The method in accordance with the invention is characterised by applying on the sheet steel surface intended to be exposed to the anti-corrosive treatment

a layer of a soft and tough adhesive, and by applying flocking fibers on the adhesive layer by means of an electrostatic application method known per se.

The treatment in accordance with the invention provides complete protection and the protective effects have a duration essentially corresponding to the serviceable life of the car. The treatment operation is easy to carry out in practice and the resulting protective layer is neither tacky nor messy. Dirt, grit or other minute particles do not tend to stick or adhere to the protective layer.

The invention will be described in closer detail in the following with reference to the accompanying drawing figure which is a cross-sectional view through a piece of sheet steel treated in accordance with the method of the invention.

As appears from the drawing figure a layer of flocking fibers 1 has been applied on the surface 4 of the sheet steel 3 with the aid of an adhesive 2. The flocking fibers 1 are anchored to the backing in a manner known per se. The surface of the sheet steel is coated with a layer of an adhesive 2. The sheet steel 3 with the fibers 1 thereon is introduced into an electrostatically magnetic field in which the steel sheet has the positive polarity and the flocking fibers the negative polarity. The fibers are flung onto the steel surface and are secured thereto standing on end.

The method of applying and securing flocking fibers is known and used in various fields, such as in interior decoration, for noise-reducing purposes, heat-insulating purposes, just to mention some of numerous fields of application.

The adhesive used must be soft and tough in order to ensure that no cracks occur in the protective layers when the sheet is exposed to working. Adhesives that have proved suitable in this respect are acrylic dispersion adhesives. Such adhesives meet the demands on function and usefulness when applied on sheet steel used for cars. Acrylic dispersion adhesives have not either any tendencies to crack when the sheets on which they are applied are exposed to bending operations.

The flocking fibers should be short, and suitable lengths for the intended purpose have proved to be lengths in the range of between 0.3 and 0.8 millimeters. Nylon fibers are highly suitable on account of the wearing strength of such fibers.

The soft surface imparted in accordance with the invention has the added effect that particles bounce away from the sheet without scratching the steel or the acrylic dispersion layer thereon.

The method described in the afore-going has proved to provide a complete anti-corrosive protection coating that possesses excellent wear resistancy. In addition, it neutralizes galvanic flow. The protective coating is easy to keep clean and particles, such as dirt and grit, do not tend to stick to the coating.

It has not been possible to determine which properties of the adhesive layer and of the layer of flocking fibers that, in combination, provide the unexpected anti-corrosive effect. Practical tests show, however, that the adhesive layer in itself does not provide satisfactory rust protection. It has been found

in practical tests that when a shiny metal surface and a flocking-fiber coated surface are wetted with equal amounts of water, the latter surface dries considerably more rapidly than the shiny surface. In one test a steel sheet sample was prepared by application on one half of the sheet of a protective coating in accordance with the invention. The sample was applied in a position wherein it separated cold air from warm air. It was found that condensation occurred only on the shiny surface. The flocking fibers so to speak displace the position of the dew-point away from the metal surface. Of some importance in this connection might be the fact that air is "trapped" between the fibers, preventing moisture from penetrating into the trapped air. It is also possible that the air between the fibers is prevented from circulation and consequently takes longer to cool, which would also give the above-mentioned effect of dew-point displacement away from the metal surface.

It should be obvious from the above description that the method in accordance with the invention involves considerable economic advantages to car owners, since the maintenance costs of the car may be reduced and the serviceable life of the car be increased.

The embodiment described above is to be regarded as an example only and a variety of modifications are possible within the scope of the appended claims. It goes without saying that the anti-corrosive treatment in accordance with the invention may be used to rust-proof other objects than cars, and that the coating may be applied on other metals than steel sheets. Owing to the condensation-inhibiting effect referred to above con-

siderable advantages may be gained by applying the method of the subject invention to other objects and in other fields than those referred to herein. As one example may be mentioned application of the method in headlamps in which case the rear face of the headlamp is provided with the flocking-fiber coating, which inhibits the formation of condensation on the reflecting front surface of the lamp due to the temperature differential, and consequently prevents corrosion. The serviceable life of headlamps can therefore be considerably prolonged.

Claims

1. An anti-corrosive treatment method for sheet steel, particularly for application in cars, boats, ships and building constructions, c h a r a c - t e r i s e d by applying on the sheet steel (3) surface (4) intended to be exposed to the anti-corrosive treatment a layer of a soft and tough adhesive (2), and by applying flocking fibers (1) on the adhesive layer (2) by means of an electrostatic application method known per se.

2. An anti-corrosive treatment method as claimed in claim 1, c h a r a c t e r i s e d i n t h a t the adhesive (2) is an acrylic dispersion adhesive.

3. An anti-corrosive treatment method as claimed in any one of the preceding claims, c h a r a c - t e r i s e d i n t h a t as the flocking fibers (1) are used fibers having a length in the range of between 0.3 and 0.8 millimeters.

4. An anti-corrosive treatment method as claimed in any one of the preceding claims, c h a r a c - t e r i s e d i n t n a t the flocking fibers (1) are nylon fibers.

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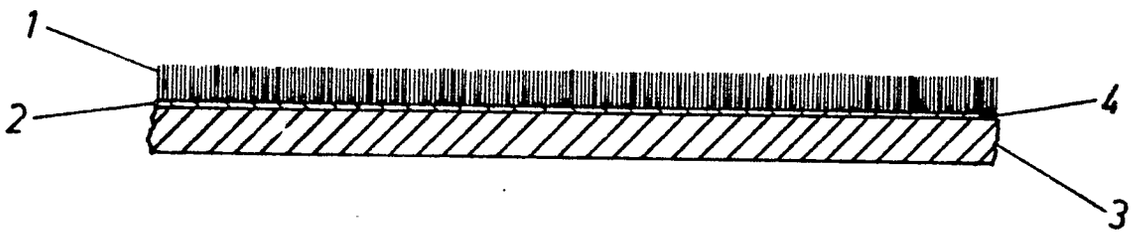

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EUROPEAN SEARCH REPORT

Application number
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DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim
X	US - A - 4 218 501 (T. KAMEYA et al.) (19-08-1980) * Totality; especially column 1, line 64 - column 2, line 15; column 3, lines 14-20, 25-28, 55-60; examples 2,3; fig.; claims *	1-4

CLASSIFICATION OF THE APPLICATION (Int Cl.³)

B 05 D 1/16
B 05 D 1/06
C 23 F 15/00

TECHNICAL FIELDS SEARCHED (Int. Cl.³)

B 05 D
C 23 F
C 09 J

CATEGORY OF CITED DOCUMENTS

X: particularly relevant
A: technological background
O: non-written disclosure
P: intermediate document
T: theory or principle underlying the invention
E: conflicting application
D: document cited in the application
L: citation for other reasons

&: member of the same patent family, corresponding document

X The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
VIENNA	30-12-1981	SLAMA