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(54) **Process for treatment of aluminium surfaces.**

(57) This consists firstly of cleaning the surface to be treated, particularly aluminium profiles and sheets, with substances such as trichloroethylene, and then drying the item. A layer of acrylic or vinylic primer or wash primer is applied and dried. Then solvents are applied to soften the surface and a mechanical treatment by brushing, stamping or by spraying chemical solvents with pigments is applied. Finally the surface is dried and a varnishing treatment is applied.

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This invention consists of a process for treatment of all kinds of aluminium profiles and sheets for decorating and protecting these, enabling production of finishes of said surfaces which resemble other materials, such as wood or natural stone.

At the present time, there are electrolytic anodizing techniques for aluminium with which the uniform colouring of the surface treated is obtained. We should here point out the existence of patent ES-547677 which deals with an electrolytic process for the treatment of aluminium surfaces.

Patent ES-2004433 refers to a process for double anodizing treatment of an aluminium item. The process according to this patent consists of a first stage of cleaning and polishing the surface, a first electrolytic coating, a mechanical phase destroying this first coating, and a further treatment which affects only the surface destroyed. This process has the disadvantage of involving a double anodizing process, and of having to destroy the first layer of electrolytic coating with great accuracy, and consequent high costs, in order to avoid damaging the material, and also that this damage means the second coating is unstable, giving unwanted results. Furthermore, by means of this process a surface cannot be treated to make it resemble wood.

ES-2022021 refers to a process and installation for continuous varnishing and decoration of metal sheets, and to a metal sheet obtained by the aforementioned process. This process, though not specifically applied to aluminium surfaces, consists of the application of anticorrosive metal deposits and the application of an anticorrosive varnish based on polyester-epoxy resins, and the firing and drying of the item. This process is also incapable of obtaining a surface looking like wood, for example.

There are numerous processes for treatment of metal surfaces, apart from the aforementioned ones, particularly for colouring and decorating these, but the imitation of surfaces of items such as wood or natural rocks has not been efficiently solved to date.

The aim of this invention is to obtain a process for treatment of aluminium surfaces so that these can reproduce surfaces looking like wood or other finishes.

One characteristic of the invention is that the treatment can be carried out on properly treated aluminium surfaces or on surfaces that have undergone an anodizing process.

The process referred to herein consists substantially of a succession of three stages, in which

- the first of said stages consists of a chemical treatment of the surface.
- the second of the stages refers to a treatment for forming the surface design, and
- the third is a coating of the treated surface.

The aforementioned stages are now described in detail:

The surface which is going to be treated is subjected to the action of an organic solvent in order to remove grease or impurities on it. In a preferential realization trichloroethylene was chosen, due to its widespread industrial diffusion, but any other solvent of similar characteristics could be used without varying the aim of the invention, and even inorganic solvents could be used, such as compounds of nitric acid.

Once the surface is clean and degreased, a vinyl or acrylic primer, or what is commercially known as a wash primer is applied to this, in combination with a colouring agent that withstands the action of ultraviolet rays. This colouring agent is preferentially made up of pigments of ceramic and/or chromophosphates base.

The drying of the substance applied is generally done at ambient temperature, but this can also be subjected to conditions to boost said drying, such as high temperature, draughts, or both.

When the surface is dry a thin layer of solvent properly combined with ceramic pigments is projected onto this. An ethyl acetate was chosen due to its particular characteristics, though any other similar one could be used. The greasiness of the solvent will depend on the optimum drying time which is to be obtained. Said solvent acts on the top layer of the surface treated, softening this and forming in said layer an ideal solution for later mechanical treatment.

The surface is thus mechanically treated by stripping the colouring agent. This stripping can be done by means of stamping a decorative element which removes the colouring substance or applies a different one.

Alternatively, the aforementioned surface can be brushed. The pressure of the brush's bristles on the treated surface, the distance between them, and the relative transversal movement of these can determine different types of finish.

The combination of the two methods can give rise to a finish similar to that of wood, in which knots can be formed.

The aforementioned mechanical treatment is not limitative, as the stamping of a different pattern to those initially intended can be achieved by other mechanical means, whether known of at the present time or not.

In the state resulting from mechanical treatment the surface can easily be damaged by atmospherical agents and affected by impact. As a result of this the fixing and protection of the surface layer must be carried out, and this is done by means of applying an acrylic coating in liquid form.

The acrylic substance added must preferably act as a filter for ultraviolet radiation in order to avoid the deterioration of the lower layers. Due to its qualities as regards withstanding the action of atmospheric agents a PVDF was chosen, a combination of acrylic and fluorinated polymers, although the use of pure

acrylic substances is also foreseen, with which less resistance is required.

The use of substances other than those indicated, but with an identical action, must be understood to be covered by this invention.

Claims

1.- A process for the treatment of aluminium profiles and sheets which enables production of finishes of said surfaces likening them to other materials, such as wood or natural stone, characterized by consisting of the following stages.

A first stage consisting of cleaning the surface with a degreasing substance, and the application of an adherent vinylic or acrylic primer, or what is commercially known as wash primer, in combination with a colouring agent that withstands the action of ultraviolet rays, and further consisting of drying the same, either in ambient conditions or by means of the application of draughts, heat or both;

a second stage consisting of projecting onto the dry surface a layer of solvent combined with ceramic pigments and formation of the surface pattern; and

a third, for fixing the surface pattern by applying a protective varnish.

2.- A process, according to claim 1, characterized in that the solvent used for the projection onto the surface being treated has a level of greasiness which depends on the drying time required for each case.

3.- A process, according to claim 2, characterized in that the solvent used for projection onto the surface treated is ethyl acetate.

4.- A process, according to claim 1, characterized in that the formation of the surface pattern is carried out by the pressure exerted by a brush.

5.- A process, according to claim 4, characterized in that the bristles of the brush can be moved at will, both statically and dynamically.

6.- A process, according to claim 1, characterized because the formation of the surface pattern is carried out by stamping.

7.- A process, according to claim 1, characterized in that the formation of the surface pattern is carried out by means of applying drops of solvent mixed with pigments.

8.- A process, according to claim 1, characterized in that the fixing of the surface is done by means of providing a mixture of acrylic and fluorinated polymers, for surfaces which require a high degree of resistance.

9.- A process, according to claim 1, characterized in that the fixing of the surface is carried out by means of applying an acrylic substance, for surfaces that do not require a high degree of resistance.

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EUROPEAN SEARCH REPORT

Application Number
EP 94 56 0001

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
A	FR-A-2 670 158 (EURO CREATION) * the whole document * ---	1	B05D5/06 B44F9/04 B44F9/02
A	US-A-4 946 715 (AVERA) * the whole document * -----	1	

TECHNICAL FIELDS SEARCHED (Int.Cl.6)
B05D B44F

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	3 March 1995	Brothier, J-A

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

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