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(54) **METHOD FOR PAINTING ALUMINIUM EXTRUDED PROFILES**

(57) A method for coating extruded aluminum profiles (1) that entails, following a cleaning treatment, an open-pore anodizing pretreatment so as to produce on the surface (4) of the extruded profile (1) a first layer (5), of oxidation.

The method then entails the sprayed application, on the first layer (5) of oxidation of the oxidized extruded profile (1), of a second layer (6), of textured solvent- or water-based bicomponent acrylic or polyurethane.

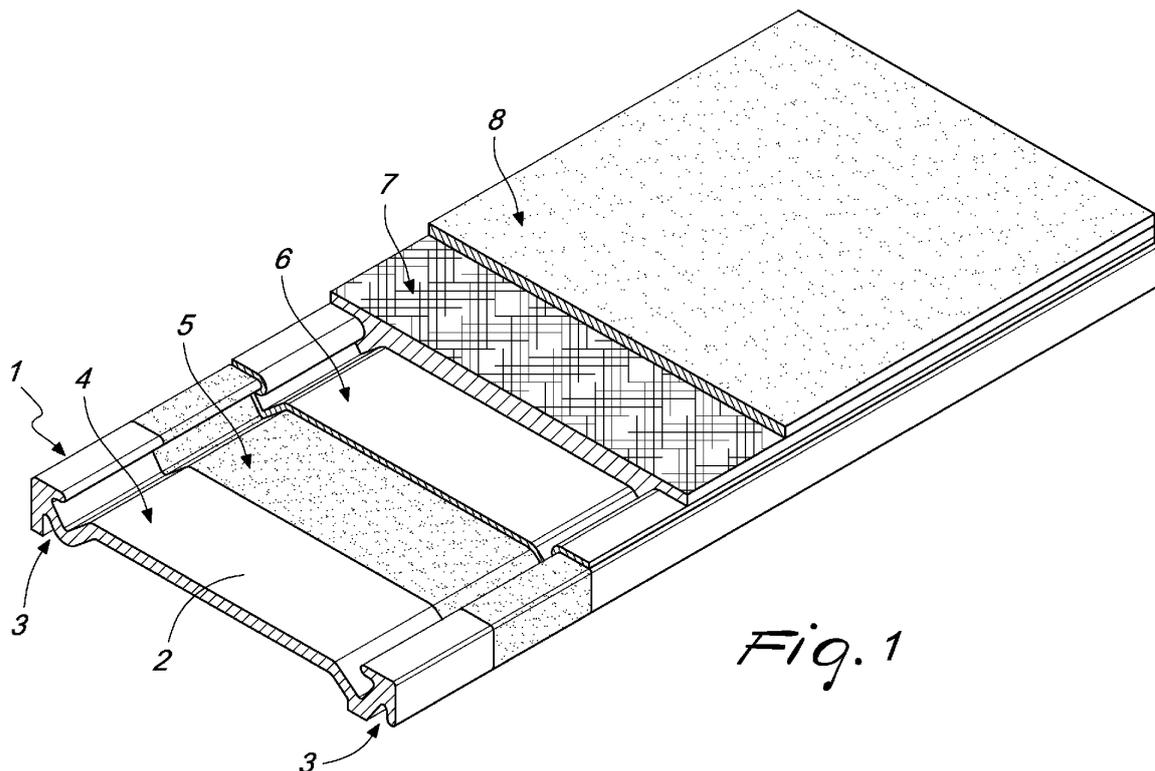


Fig. 1

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Description

[0001] The present invention relates to a method for coating extruded aluminum profiles.

[0002] Nowadays it is known to provide in-wall frames for retractable sliding doors, which have the cross-section of the perimetric wall of the passage opening, which is provided via the use of extruded aluminum profiles.

[0003] Such extruded profiles lend themselves particularly well to this type of requirement because, by drawing through a die installed in special plants, particular protrusions and/or tabs in relief are obtained which later serve, during installation, to retain the plaster and/or the putty, and so obtain an excellent and even finishing that integrates well with the rest of the wall, both of the facade of the wall adjacent to the passage opening and of the perimetric end face of the passage opening itself, the cross-section of the wall.

[0004] With this type of product therefore it becomes possible to obtain a minimal solution (in-wall frame without jamb and architraves), i.e. without coverings and borders that protrude from the wall, something that is by contrast visible in the traditional solution (in-wall frame with jamb and architraves), i.e. the solution obtained by installing a normal in-wall frame.

[0005] The conventional profiles used to obtain this result must then be painted the same as the wall, so that they become as similar to the wall as possible.

[0006] It is therefore known to also provide smooth profiles, which are used to line the perimeter of the hole in the wall and which are then painted; this solution however is not optimal, since wall paint on this type of material, whether aluminum or ferrous material, does not have a good anchorage and, with the oxidation of the material, in particular of aluminum, will tend to peel or flake off over time and furthermore it does not have the same aesthetic characteristics as the material with which the wall is covered.

[0007] In order to overcome this drawback and in order to offer a better aesthetic solution, the same applicant provides profiles on which cavities are provided which are subsequently filled using real plaster, thus creating a base that makes it possible, via a surface finish with plaster and/or fine mortar and/or putty, to obtain the same result as the wall in which the in-wall frame is installed.

[0008] However, this solution too presents drawbacks: for example it cannot be easily industrialized, therefore the production yield is very low.

[0009] Furthermore, the profiles thus treated need to be protected from accidental bending that could occur during transport and/or mounting.

[0010] In this last case in fact the filling plaster tends to form cracks and to chip.

[0011] Furthermore the aesthetic result before installation is not entirely satisfactory, since the plaster smears the profiles a great deal with residues of sand and cement.

[0012] The aim of the present application is to resolve

the abovementioned technical problems, eliminating the drawbacks in the cited known art, by providing a method that makes it possible to industrialize the painting of extruded aluminum profiles so as to contain the costs for obtaining the respective profiles.

[0013] Within the above aim, an object of the present invention is to provide a method that makes it possible to obtain a painted profile in such a way that the profile can receive the desired finish during the installation thereof as parts of in-wall frames for retractable sliding doors.

[0014] Another object of the invention is to provide a method that makes it possible to obtain a painted profile in such a way that the profile is free from cracks or chips during mounting or transport.

[0015] Another object of the invention is to provide a method that makes it possible to obtain a painted profile in such a way that the profile has a high quality finishing appearance even before its installation.

[0016] Another object of the invention is to provide a method that can easily be industrialized.

[0017] This aim and these and other objects which will become more apparent hereinafter are achieved by a method for coating extruded aluminum profiles, characterized in that it entails, on said extruded profile, following a cleaning treatment, an open-pore anodizing pretreatment so as to produce on the surface of said extruded profile a first layer, of oxidation, followed by the sprayed application, on said first layer of oxidation of said oxidized extruded profile, of a second layer, of textured solvent- or water-based bicomponent acrylic or polyurethane.

[0018] Further characteristics and advantages of the invention will become more apparent from the detailed description of a particular but not exclusive embodiment thereof, illustrated by way of non-limiting example in the accompanying drawings, wherein:

[0019] Figure 1 is a partially cross-sectional perspective view of an example of an extruded profile according to the present invention.

[0020] In the exemplary embodiment that follows, individual characteristics, given in relation to specific examples, may actually be interchanged with other, different characteristics that exist in other exemplary embodiments.

[0021] With reference to the figure, the method according to the invention makes it possible to obtain the painting of extruded aluminum profiles 1, of the type used, not exclusively, for providing in-wall frames for retractable sliding doors which can be constituted by one or more one or more horizontal or vertical profiled elements, by one or more front posts, by one or more abutment posts, by one or more rear posts, by one or more horizontal crossmembers, by one or more upper crossmembers for such rear posts, such front posts and such abutment posts and also by a support for a track/guide for sliding trolleys with which sliding doors or leaves are associated, all made of metal plate (not shown).

[0022] The extruded profile 1 can have the desired

shape and size and therefore can be constituted by a simple aluminum bar or by a product having a desired transverse cross-section adapted to determine the presence of at least one flat base 2 with one or more variously-shaped optional wings or tabs 3 as a function of the use of the extruded profile.

[0023] The method entails carrying out a prior treatment to clean the extruded profile 1 using for example some processes which can be mechanical brushing, degreasing, pickling, chemical satin finishing, or neutralization; such treatment serves to eliminate any traces, impurities or imperfections owing to the extrusion.

[0024] The satin finishing can also be carried out via sandblasting of the product.

[0025] The method then entails carrying out an open-pore anodizing pretreatment in which the extruded profile 1 is immersed in vats (electrolytic cells); via an electrochemical process, a first layer 5, of oxidation, is formed on the surface 4 of the extruded profile 1.

[0026] Such first layer 5 advantageously has a thickness comprised between 3 and 8 μm (micrometers).

[0027] The oxidation is not fixed, because non-fixed oxidation is very porous and allows a greater adherence for the subsequent step of the method which needs to be carried out within a determined length of time and in any case before the first layer 5 can absorb the humidity present in the environment.

[0028] The method then entails carrying out the sprayed application, on the first layer 5 of oxidation of the oxidized extruded profile 1, of a second layer 6, of textured bicomponent solvent- or water-based acrylic or polyurethane.

[0029] For the second layer 6 of textured solvent-based bicomponent acrylic or polyurethane, the sprayed application is thus carried out on the first layer 5 which is open-pore, making it possible to obtain an excellent adherence.

[0030] The second layer 6 of textured solvent-based bicomponent acrylic or polyurethane is formulated with textured hydroxylated acrylic or polyurethane resin, i.e. a resin to which granules/balls have been added which confer roughness to the second layer 6, with a particle size that varies from 40 to 400 μm , and cross-linked with preferably an isocyanate, aliphatic or semialiphatic catalyst.

[0031] The particle size of the granules/balls determines the roughness of the extruded profile 1 (also called texturing): the smaller the diameter of the granule/ball, the less rough the extruded profile 1 will appear to the touch; the greater the diameter of the granule/ball, the rougher the extruded profile 1 will appear to the touch.

[0032] The sprayed application of the second layer 6 advantageously entails the use of a zinc phosphate-based acrylic or polyurethane product enriched with a catalyst or hardening agent for acrylics or polyurethanes and textured.

[0033] The texturing serves to obtain once again a surface that is rough and/or in relief, such as to create a

good adherence base for the subsequent additional applications.

[0034] The texturing further serves to obtain a profile 1 that is aesthetically well integrated in the wall, so as to be similar to the finishing of the rest of the wall in which the in-wall frame will be installed, including the end face of the passage hole, particularly for walls made of masonry that have a rougher surface.

[0035] The aluminum extruded profile 1 undergoes successive finishing treatments to be carried out during the installation of the profile on site, making a filling by applying a third layer 7 using a plaster or a mortar, for in-wall frames for plaster to be installed in masonry walls, or a putty, for in-wall frames for plasterboard to be installed in plasterboard walls.

[0036] This application is used in order to make the surface of the profile thus treated the same as the type of wall in which that profile is installed; for example, it is known that the dividing walls inside houses can be provided using dry systems, i.e. systems constructed with metallic frames on which slabs of plasterboard are placed and fixed, or made of masonry.

[0037] In the first case, the filling will need to be done using special putty for plasterboard, given that this product makes the surface as smooth as that of slabs of plasterboard, therefore with the same aesthetic result.

[0038] In the second case, the filling will need to be done using plaster or fine mortar, as these products make the surface slightly rough like that of the other walls made of masonry, which are treated with the same product and therefore aesthetically identical.

[0039] The extruded profile 1 thus treated undergoes subsequent processing with the application of wall paint in order to define a fourth layer 8.

[0040] In general, therefore, the invention also relates to an extruded aluminum profile 1 having a first layer 5, of oxidation, having a thickness comprised between 3 and 8 μm (micrometers), a second layer 6, of textured bicomponent acrylic or polyurethane, with a particle size that varies from 40 to 400 μm , composed of a hydroxylated zinc phosphate-based acrylic or polyurethane resin cross-linked with an isocyanate, aliphatic or semialiphatic catalyst, or composed of a textured solvent- or water-based acrylic or polyurethane resin enriched with a catalyst or hardening agent for solvent- or water-based products, a third layer 7, of finishing using a plaster or a fine mortar or a filler, and a fourth layer 8, of finishing composed of wall paint.

[0041] A result is thus obtained that is comparable with that obtainable in the known art using other methods but with an industrialized process and furthermore the treated product can be handled without problems because, even if the profiles should bend during transport or installation, the finishing does not come off.

[0042] The processed product furthermore makes it possible to obtain an excellent adherence for subsequent applications of product and/or treatments and the in-wall frame provided with these profiles is aesthetically well

integrated in the wall.

[0043] Thus it has been found that the method has achieved the set aim and objects, by making it possible to industrialize the treatment, in particular the painting, of extruded aluminum profiles so as to contain the costs of obtaining those profiles.

[0044] Furthermore the method makes it possible to provide a treated profile so that it can subsequently receive the desired finish during the installation thereof for example as parts of in-wall frames for retractable sliding doors.

[0045] The method also makes it possible to obtain a painted aluminum extruded profile in such a way that it is free from cracks or chips during mounting or transport and in such a way that the profile has a high quality finishing appearance even before its installation.

[0046] Finally the profile thus obtained ensures a rapid drying after the application of the fourth layer, thus reducing the drying times.

[0047] Naturally the invention is susceptible of numerous modifications and variations, all of which are within the scope of the appended claims.

[0048] The materials used, as well as the dimensions that constitute the individual components of the invention, may of course be more pertinent according to the specific requirements.

[0049] The various means of achieving certain different functions certainly need not coexist only in the embodiment shown, but may be present in many embodiments, even if they are not shown. The characteristics indicated above as advantageous, convenient or the like, may also be missing or be substituted by equivalent characteristics.

[0050] The disclosures in Italian Patent Application No. 10202000010207 from which this application claims priority are incorporated herein by reference.

[0051] Where the technical features mentioned in any claim are followed by reference numerals and/or signs, those reference numerals and/or signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly, such reference numerals and/or signs do not have any limiting effect on the interpretation of each element identified by way of example by such reference numerals and/or signs.

Claims

1. A method for coating extruded aluminum profiles (1), **characterized in that** it entails, on said extruded profile (1), following a cleaning treatment, an open-pore anodizing pretreatment so as to produce on the surface (4) of said extruded profile (1) a first layer (5), of oxidation, followed by the sprayed application, on said first layer (5) of oxidation of said oxidized extruded profile (1), of a second layer (6), of textured solvent- or water-based bicomponent acrylic or polyurethane.

2. The method for coating extruded aluminum profiles (1) according to claim 1, **characterized in that** it entails the execution of a prior treatment for cleaning said extruded profile (1) by way of processes of mechanical brushing, or degreasing, or pickling, or chemical satin finishing, or neutralization, or sand-blasting.

3. The method for coating extruded aluminum profiles (1) according to claim 1, **characterized in that** in said open-pore anodizing pretreatment said extruded profile (1) is immersed in vats in which said first layer (5) of oxidation is formed via an electrochemical process on said surface (4) of said extruded profile (1), and has a thickness comprised between 3 and 8 μm (micrometers).

4. The method for coating extruded aluminum profiles (1) according to one or more of the preceding claims, **characterized in that** said sprayed application on said first layer (5) of oxidation of said oxidized extruded profile (1) forms a second layer (6), of textured solvent-based acrylic or polyurethane.

5. The method for coating extruded aluminum profiles (1) according to one or more of the preceding claims, **characterized in that** said sprayed application on said first layer (5) of oxidation of said oxidized extruded profile (1) forms a second layer (6) of textured water-based acrylic or polyurethane.

6. The method for coating extruded aluminum profiles (1) according to one or more of the preceding claims, **characterized in that** said second layer (6) of acrylic or polyurethane is formulated with textured acrylic or polyurethane resin with a particle size that varies from 40 to 400 μm and which is cross-linked with an isocyanate, aliphatic or semialiphatic catalyst.

7. The method for coating extruded aluminum profiles (1) according to one or more of the preceding claims, **characterized in that** said second layer (6) comprises the use of a zinc phosphate-based acrylic or polyurethane product enriched with a catalyst or hardening agent for acrylics or polyurethanes and textured.

8. The method according to one or more of the preceding claims, **characterized in that** it comprises finishing processes to be performed during the installation stage of said previously-processed extruded profile (1), making a filling by applying a third layer (7) using a plaster or a fine mortar or a filler.

9. The method according to one or more of the preceding claims, **characterized in that** it comprises finishing processes to be performed during the installation stage of said previously-processed extruded

profile (1), such as the application of wall paint so as to define a fourth layer (8).

10. An extruded aluminum profile (1), **characterized in that** it has a first layer (5), of oxidation, having a thickness comprised between 3 and 8 μm (micrometers), a second layer (6), of textured bicomponent acrylic or polyurethane, with a particle size that varies from 40 to 400 μm , composed of a hydroxylated zinc phosphate-based acrylic or polyurethane resin cross-linked with an isocyanate, aliphatic or semi-aliphatic catalyst, or composed of a textured solvent- or water-based acrylic or polyurethane resin enriched with a catalyst or hardening agent for solvent- or water-based products, a third layer (7), of finishing using a plaster or a fine mortar or a filler, and a fourth layer (8), of finishing composed of wall paint.

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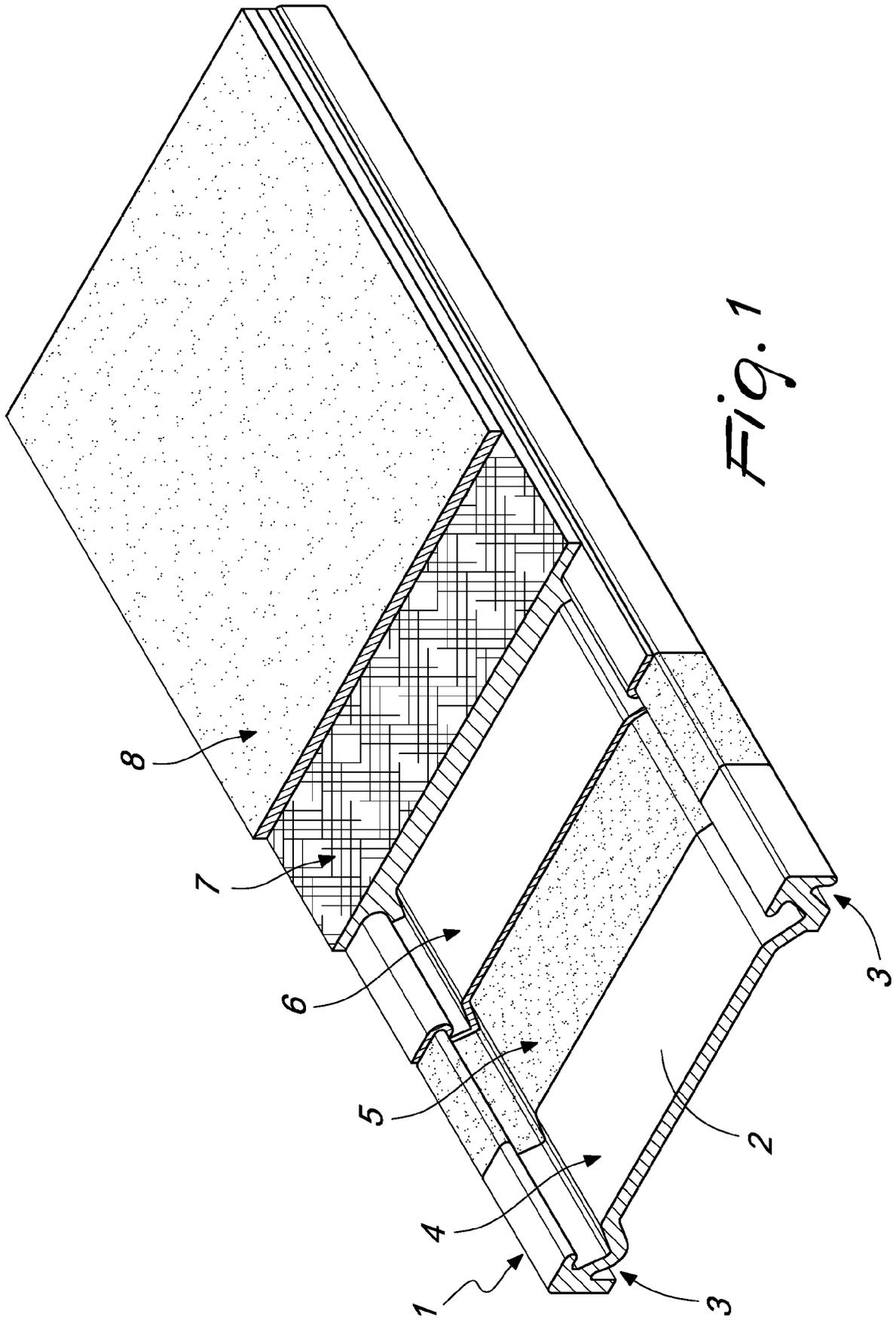


Fig. 1



EUROPEAN SEARCH REPORT

Application Number
EP 21 17 2312

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			C25D E06B B41M B05D
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 1 July 2021	Examiner Telias, Gabriela
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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**ANNEX TO THE EUROPEAN SEARCH REPORT
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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.
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01-07-2021

10	Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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