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(54) **METHOD FOR MAKING AN ARTICLE OF MANUFACTURE FOR COVERING SURFACES**

(57) A method for manufacturing, from a raw product, a corresponding finished product for covering surfaces of buildings in general and naval furnishings, internal and external, the raw product having an internal surface and an external surface and being a three-dimensional product, the method comprising the phases of covering at least the external surface of the three-dimensional raw product so as to transform the raw product into a finished three-dimensional product having at least the desired properties of mechanical, flame and salt-spray resistance, and the desired aesthetic properties, such as to render the finished three-dimensional product suitable for being operatively associated with a predetermined plurality of identical finished three-dimensional products to cover a surface and to give the surface the desired properties of mechanical, flame and salt-spray resistance, and the desired aesthetic properties.

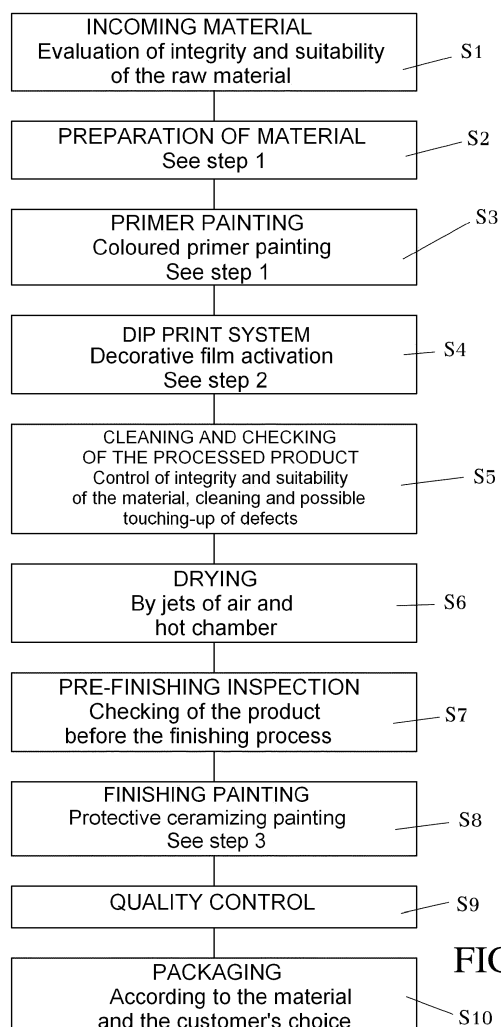


FIG. 7

Description

BACKGROUND OF INVENTION

[0001] The present invention relates to a method for making and article of manufacture for covering surfaces in general, said article being a three-dimensional product having at least the desired properties of mechanical, flame and salt-spray resistance, and the desired aesthetic properties.

[0002] As is known, there is currently a strongly felt need for covering building surfaces and naval internal or external furnishings, for example internal and external, with cover elements, generally configured like so-called cladding tiles, in a wide variety of materials, preferably extremely robust and unalterable over time, such as metal materials for example, especially steel, aluminium and/or similar materials, to provide the covered surfaces with the desired properties of resistance, for example, to atmospheric agents and fire, and also the desired aesthetic properties.

SUMMARY OF INVENTION

[0003] The main aim of the present invention is intended to satisfy this need.

[0004] More specifically, the task of the present invention is to provide a method for manufacturing a product for covering building surfaces in general, this method including a minimum number of steps and capable of producing the aforementioned product with the desired properties of mechanical, flame and salt-spray resistance, and the desired aesthetic properties.

[0005] Within this aim, a main object of the present invention is to provide a method of the indicated type, starting from a prefabricated raw covering product.

[0006] A further object of the present invention is to provide a method of the indicated type that can use commercially available materials and finishing equipment for processing the individual raw covering products.

[0007] The last, but not least, object of the present invention is to provide a covering product in the finished state, obtained through the method of the invention, which can be installed in an extremely quick and simple manner, even by inexperienced operators, to cover the intended surfaces, internal or external, of buildings in general, in particular modern buildings such as skyscrapers, and naval furnishings, internal and external.

[0008] According to one aspect of the present invention, the above-mentioned aim and objects, as well as further objects, which will become clearer hereinafter, are achieved by a method for manufacturing, from a prefabricated raw product, a finished product for covering building surfaces in general, said finished product having at least the desired properties of mechanical, flame and salt-spray resistance, as well as the desired aesthetic properties, said product having an internal surface and an external surface, characterized in that said product is

a three-dimensional product, and that said method comprises the phase of providing a three-dimensional raw product and covering at least said external surface of said three-dimensional raw product with cladding or covering materials designed to transform said raw product into a finished three-dimensional product having at least the aforesaid properties of mechanical, flame and salt-spray resistance, and aesthetic properties, such as to render said finished three-dimensional product suitable for being operatively associated, in an extremely quick and simple manner, with a predetermined plurality of identical said finished three-dimensional products to cover any intended surface of buildings, and also to give this covered surface the aforesaid desired properties of mechanical, flame and salt-spray resistance, as well as the desired aesthetic properties.

BRIEF DESCRIPTION OF DRAWINGS

[0009] Further characteristics and advantages of the method of the present invention, as well as of the finished product produced therewith, shall become clearer hereinafter from the following detailed description of a currently preferred embodiment, illustrated in the accompanying schematic drawings, in which:

Fig. 1 shows a schematic rear perspective view of a raw product to be processed using the method of the present invention to obtain a finished product for covering any desired surfaces of buildings in general; Fig. 2 shows a schematic view of a step of covering at least the external surface of the three-dimensional raw product in Fig. 1 with a film of specific pigments, as shall be described in greater detail hereinafter; Fig. 3 shows the raw product in Fig. 2 with the pigment film in Fig. 2 applied on at least its external surface; Fig. 4 shows a front view of the finished product in Fig. 3; Fig. 5 shows a side view of the finished product in Fig. 4; Fig. 6 shows a further side view of the finished product from the preceding Figures 1 to 5; Fig. 6A shows a further perspective view in which a plurality of finished products, for example, hexagonal tiles, are coupled at their sides for covering any desired surface of a building; Fig. 7 shows a flowchart of the method for producing the finished product of the present invention; and Fig. 8 shows a further, more detailed flowchart illustrating the main stages in the production of the finished product of the present invention.

DESCRIPTION OF PREFERRED EMBODIMENT

[0010] With specific reference to the above-mentioned figures, and to Fig. 1 in particular, the inventive product, still in a raw state and seen from behind, has been gen-

erally indicated by reference numeral 1 and comprises a substantially hexagonal product body 2, from a rear central part of which a peg-like threaded metal element 3 extends.

[0011] According to the present invention, the preferred material for the raw product 1 is a metal, for example steel, aluminium, brass, and/or similar materials.

[0012] In Fig. 2, a perspective view of the raw product 1 from its external surface 2' is shown, together with a sheet or film 3' of an opportunely pigmented material, about to be applied to the raw product 1 by means of the inventive method, which will be described in greater detail hereinafter.

[0013] In Fig. 3, the product, shown in the finished state, has been generally indicated by reference numeral 100, and the external surface of the product has been opportunely finished by application of the above-mentioned pigment film 3' using the aforesaid inventive method, which will be described in greater detail hereinafter.

[0014] According to the main aspect of the invention, the inventive method is applied to a three-dimensional product, which constitutes the gist of the present invention, as the Applicant, for example, is not aware of any three-dimensional product having the characteristics of the inventive product obtained with this inventive method.

[0015] In Fig. 6A, a plurality of finished hexagonal products 100 are shown operatively coupled to each other, at their respective sides, to cover, like tiles, any external or internal surface of a building.

[0016] Referring now to Figs. 7 and 8, Fig. 7 shows a flowchart for manufacturing the finished product 100 of the present invention.

[0017] In greater detail, in a first step S1 of the flowchart, the integrity and suitability of the incoming material, i.e. the individual prefabricated raw products 1, is evaluated.

[0018] In a subsequent step S2, the raw product is further prepared as indicated later on in a first stage of the inventive method.

[0019] In a subsequent step S3, the raw product 1 is subjected to a painting operation, i.e. application of a coloured primer.

[0020] In a subsequent step S4, the raw product from step S3 is subjected to a dip print operation, in which a complex decorative film is applied and activated.

[0021] In a subsequent step S5, the product from step S4 is subjected to a cleaning operation and further checking to control its integrity, possible cleaning operations and the possible touching-up of defects also being performed in step S5.

[0022] In a subsequent step S6 of the inventive method, the product from step S5 is subjected to a drying operation, preferably by jets of hot air, in a specially provided hot chamber, not shown.

[0023] In a subsequent step S7, the product processed in step S6 is subjected to a pre-finishing inspection, i.e. the product is checked before the actual finishing process.

[0024] In a subsequent step S8, the product from step S7 is subjected to application of a finishing coat, preferably using a protective ceramizing paint, as will be described in greater detail hereinafter.

[0025] In a subsequent step S9, the product from step S8 is subjected to a further quality control check.

[0026] Finally, in a last step S10, the product from step S9 is packed, individually or together with other identical products 100, in a suitable packaging material, chosen, for example, by the customer.

[0027] With specific reference to Fig. 8, this shows the three main stages F1 to F3 of the inventive method, the individual detailed steps of which are shown in Fig. 7.

[0028] In a first main stage F1 of the inventive method, the prefabricated raw product 1 is prepared and the above-mentioned coloured primer paint, preferably of the two-component xylene-based type with bonding and antioxidant functions, is applied on the external surface 2' of this raw product 1; in this first stage, the applied paint will be left to dry for the time needed.

[0029] In the following second stage F2 of the inventive method, the product from the first stage F1 is subjected, as stated, to processing by a dip print system, for example by means of a mechanical arm, not shown, in which the product from stage F1 is immersed in a tank (also not shown) containing demineralised water, for example at 29°C.

[0030] In this second stage, according to the present invention, the surface of the product from stage F1 is brought into contact with the above-mentioned pigment film 3', i.e. a film carrying opportune pigments applied thereon and which advantageously constitutes a water-soluble support.

[0031] In this stage F2, the above-mentioned pigment film is made to adhere, preferably, to only the external surface of the product through the effect of capillarity and hydrostatic pressure.

[0032] Then, in the same stage F2, the product subjected to the previous dip print system processing is further washed in a tunnel, not shown, preferably with jets of hot water at 45°C, to remove residual parts of the pigment film 3'.

[0033] Finally, in a further, third stage F3 of the inventive method, an opportune protective ceramizing paint, preferably of the acrylic type, is applied to the product, as can be seen in the previous flowchart.

[0034] Optionally, this paint can be gloss or matt.

[0035] The Applicant has found that optimal results are achieved with a ceramizing paint applied in quantities of roughly 90 grams per square metre of the product's external surface.

[0036] At the end of the aforesaid inventive method, the three-dimensional product 100 is as shown in Figs. 4 to 6 and will have the desired properties of mechanical, flame and salt-spray resistance, as well as advantageous and very satisfactory aesthetic properties, for example, but not limited to, those of a root wood type.

[0037] Due to the presence of the threaded peg 3, the

product can also be applied quickly and easily, even by untrained personnel, to any surface, external or internal, of any building to be covered, protected and/or aesthetically harmonized.

[0038] From the foregoing, it can be appreciated that the present invention fully achieves the intended aim and objects.

[0039] In fact, starting from a prefabricated raw product 1, preferably made of metal, the present invention processes this prefabricated raw product, by means of the inventive method, to obtain the desired product in a finished state 100 having the desired properties that have already been mentioned several times.

[0040] Although the method and the finished three-dimensional product 100 of the present invention have been described with specific reference to two currently preferred embodiments, it should be borne in mind that the foregoing description is susceptible to numerous modifications and variants, all falling within the scope of the inventive concept.

[0041] For example, although reference was made throughout the foregoing description to a specific method of processing a raw product to obtain the novel finished product, the method of the invention could obviously be expanded to also include the method of production of the material or raw product, this auxiliary prefabrication method obviously being easily conceived by an expert in the field, according to the specific material of the initial raw product.

[0042] Thus, rather than by the foregoing description, the invention should be considered as only limited by the appended claims below.

Claims

1. A method for manufacturing a finished product for covering surfaces, **characterized in that it comprises** the phases of:

making a three-dimensional raw product having an external surface and an internal surface; covering at least said external surface of said three-dimensional raw product so as to transform said raw product into a finished three-dimensional product having at least the desired properties of mechanical, flame and salt-spray resistance, and the desired aesthetic properties, such as to render said finished three-dimensional product suitable for being operatively associated with a predetermined plurality of identical said finished three-dimensional products to cover a surface of a building or naval furnishings, internal or external, for giving said surface said desired properties of mechanical, flame and salt-spray resistance, and said desired aesthetic properties.

2. A method according to claim 1, **characterized in that** it comprises the steps of:

checking a state of integrity and suitability of said three-dimensional raw product;
applying a coloured primer paint to said external surface of said raw product;
subjecting said raw product to a dip-printing process;
subjecting said raw product to possible touching-up of defects;
drying said raw product;
painting said raw product with a protective paint to obtain said finished product.

3. A method according to claim 2, **characterized in that it comprises** applying a two-component primer paint on at least said external surface of said three-dimensional raw product.

4. A method according to claim 3, **characterized in that** said two-component primer paint is a xylene-based paint with a bonding and antioxidant function, suitable for being dried in a predetermined drying time.

5. A method according to claim 2, **characterized in that** said dip-printing process is implemented by the immersion of said product in demineralized water and by the further phase of at least said surface of said product coming into contact with pigments applied on a water-soluble support film so as to make said pigments adhere to said surface due to the effect of capillarity and hydrostatic pressure.

6. A method according to claim 5, **characterized in that** said method also includes washing said product with jets of hot water at approximately 45°C.

7. A method according to claim 2, **characterized in that** said painting step is implemented by applying to said product a protective, ceramizing, acrylic paint, gloss or matt, in quantities of approximately 90 grams per square metre of said external surface of said three-dimensional product.

8. A method according to claim 1, **characterized in that** it includes the further steps of subjecting the finished product to final quality control and packaging said finished product.

9. A finished three-dimensional product for covering surfaces of a building or naval furnishings, internal and external, **characterized in that it comprises** a three-dimensional body having an external surface and an internal surface; at least said external surface of said three-dimensional body being covered to give it properties of mechanical, flame and salt-spray re-

sistance, and aesthetic properties; said finished three-dimensional product being suitable for being operatively associated with a predetermined plurality of identical said finished three-dimensional products to cover a surface of a building or naval furnishings, internal and external, to give said surface said desired properties of mechanical, flame and salt-spray resistance, and said desired aesthetic properties.

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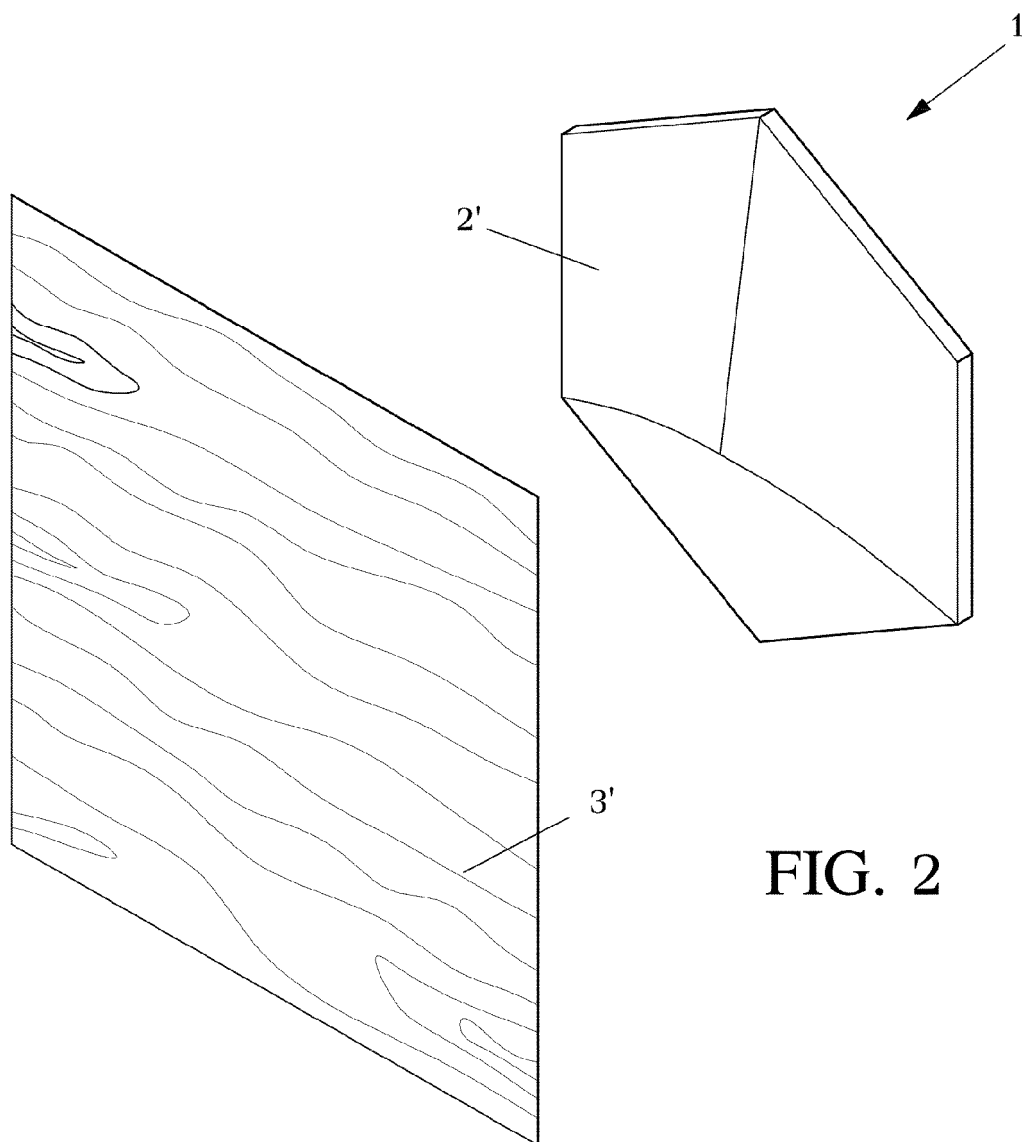
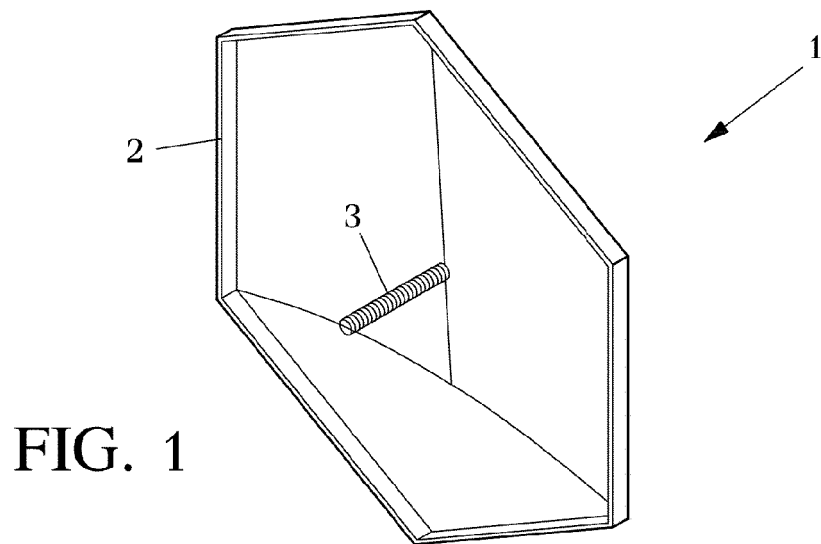
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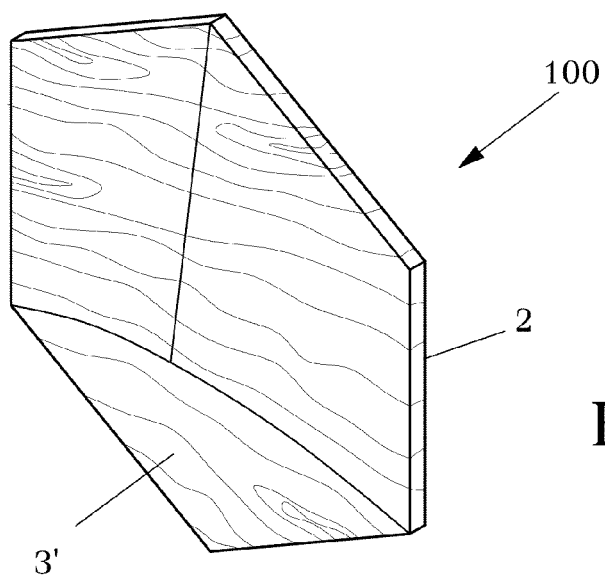


FIG. 3

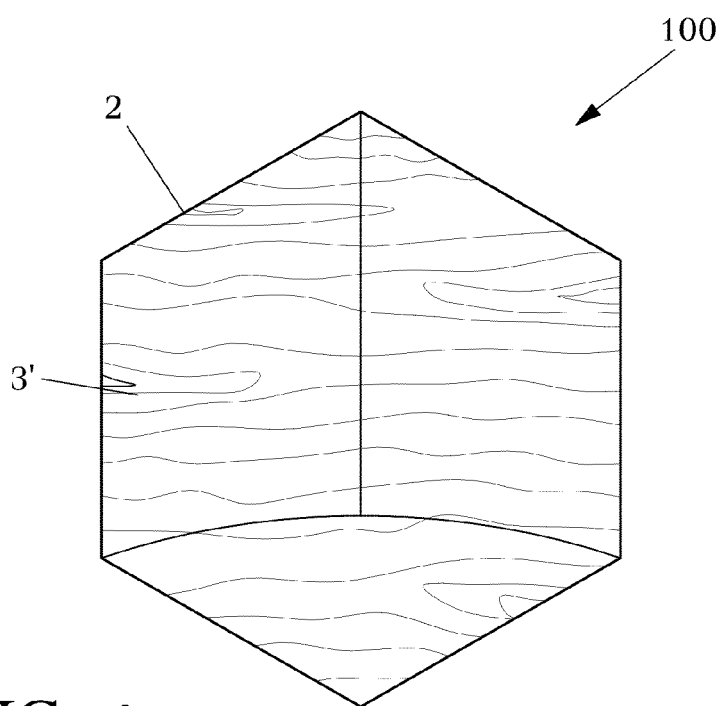


FIG. 4

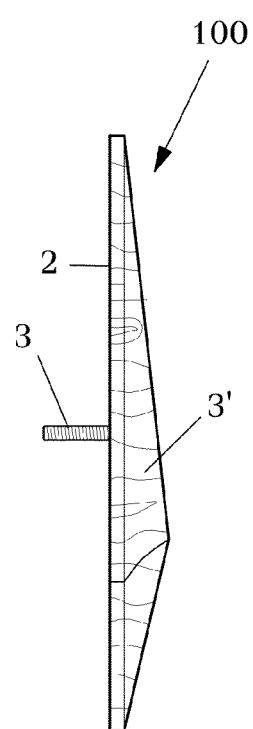


FIG. 5

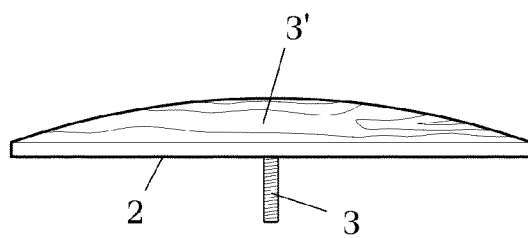


FIG. 6

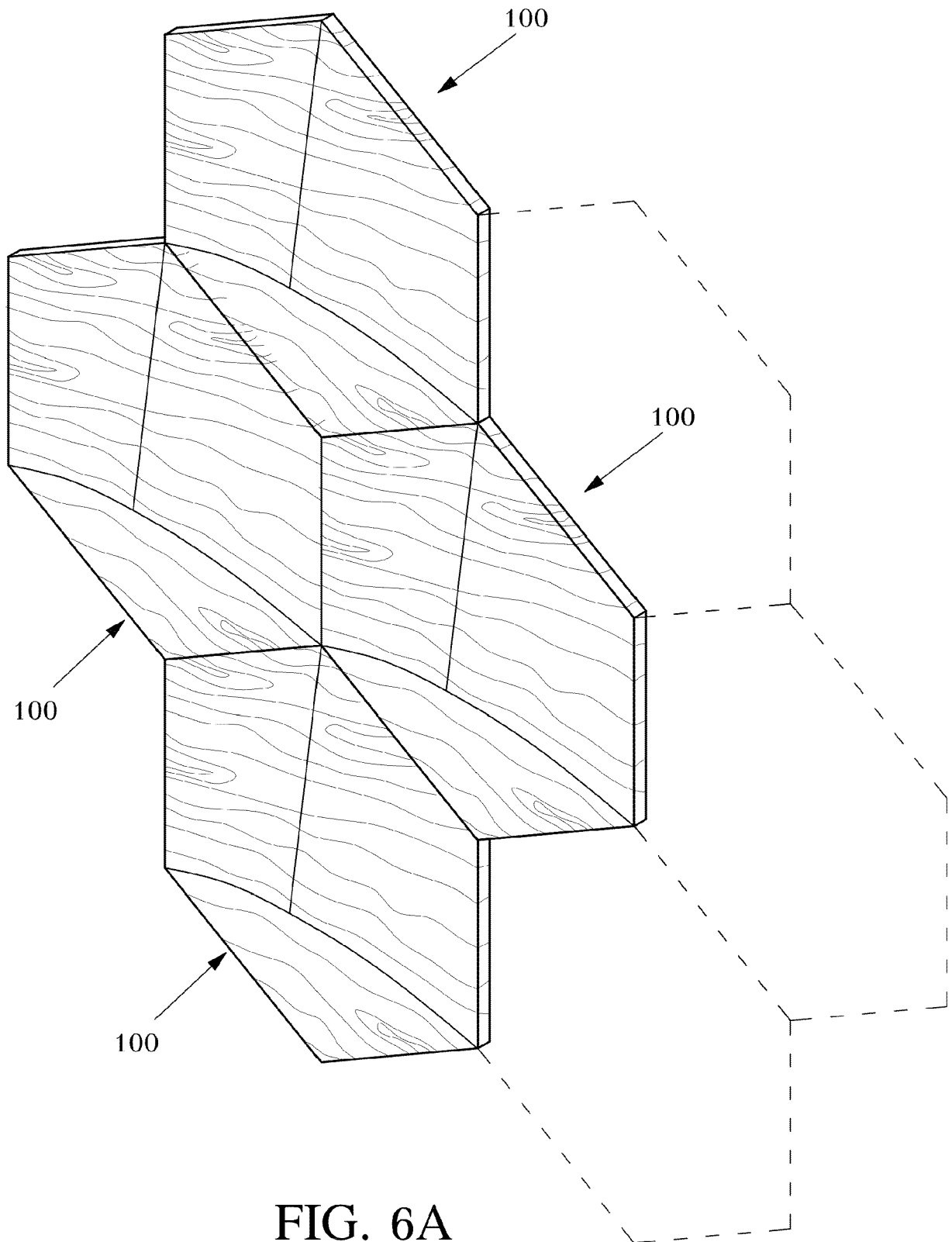


FIG. 6A

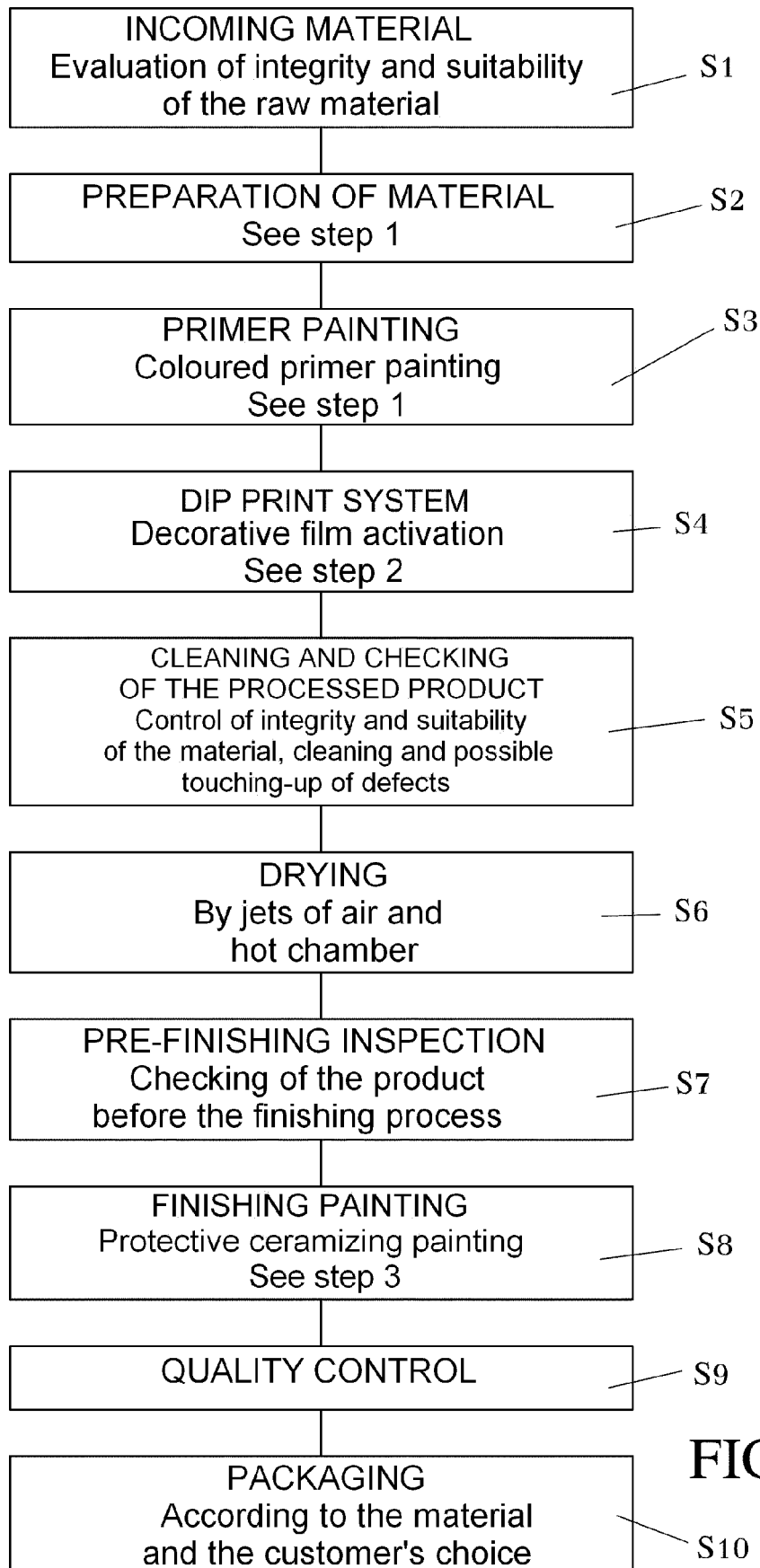


FIG. 7

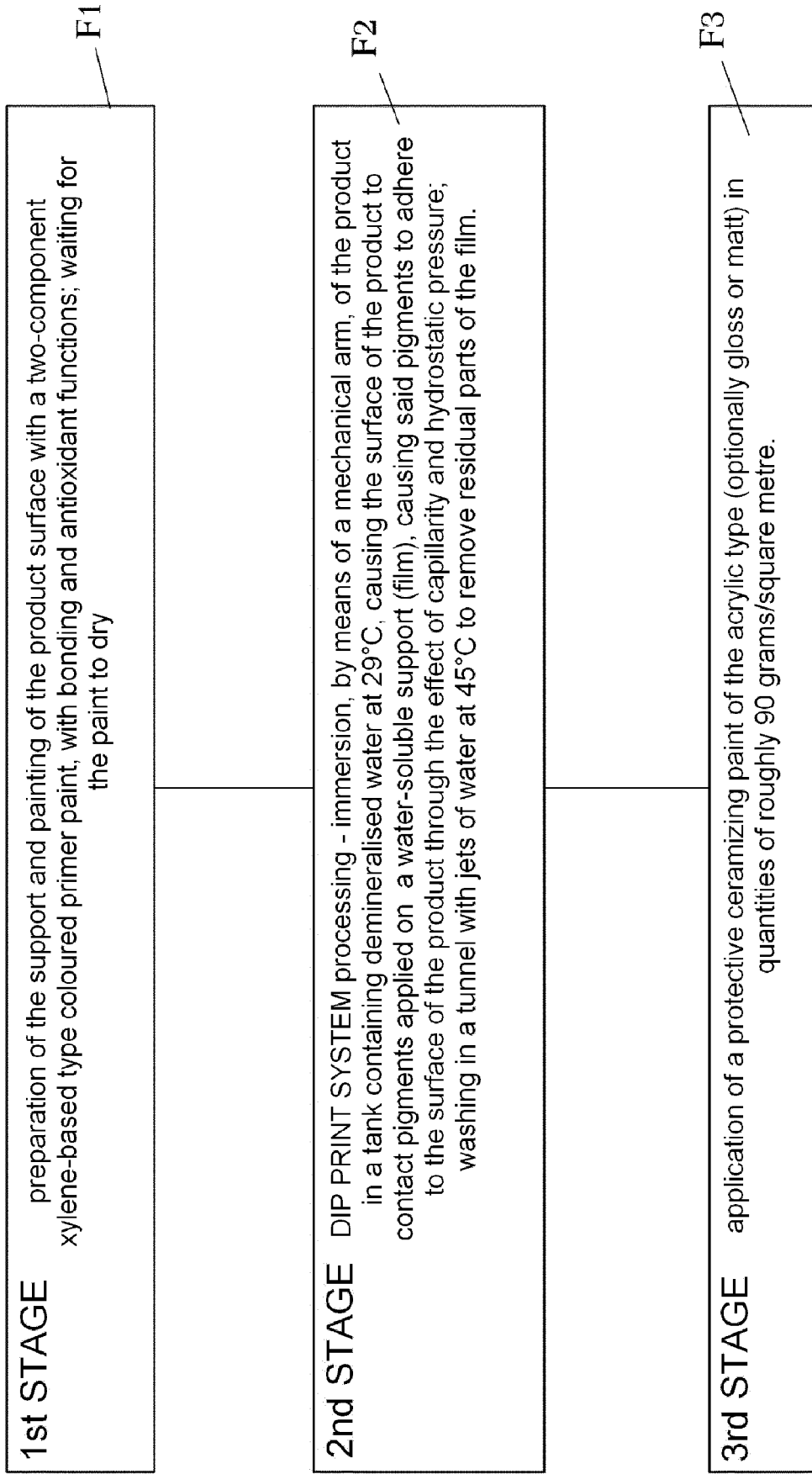


FIG. 8



EUROPEAN SEARCH REPORT

 Application Number
 EP 17 18 3630

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Y	* abstract; figures 1-5 * * paragraph [0001] * * paragraphs [0003], [0004] * * paragraph [0009] - paragraph [0012] * * paragraph [0019] - paragraph [0026] *	4	
X	US 2004/241335 A1 (MOTZKO DALE GERARD [US] ET AL) 2 December 2004 (2004-12-02)	1,2,5-9	
Y	* figures 2,3 * * paragraph [0014] * * paragraph [0027] - paragraph [0028] * * paragraph [0031] - paragraph [0032] *	3,4	
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X	US 6 428 647 B1 (KOH HYUN-JOO [KR] ET AL) 6 August 2002 (2002-08-06) * abstract * * column 1, line 5 - line 14 * * column 1, line 35 - line 43 * * column 2, line 15 - line 27 * * column 2, line 62 - line 65 * * column 3, line 10 - column 4, line 59 * * column 5, line 21 - line 45; table 2 * * page 6, line 42 - line 56 * ----- -/--	1-9	
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 4 December 2017	Examiner Maxisch, 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			

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EUROPEAN SEARCH REPORT

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Y	* figure 2 *	3,4	
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Place of search The Hague		Date of completion of the search 4 December 2017	Examiner Maxisch, 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			

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**ANNEX TO THE EUROPEAN SEARCH REPORT
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EP 17 18 3630

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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