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(54) **SLATS AND METHOD OF MANUFACTURING SLATS**

(57) A slat (100) intended to form part of the roof of a covering, for example a pergola, is described. The slat (100) comprises a metal body (104) which comprises at least one face (106), characterized in that this face (106) is coated with a polymer film (202), wherein the metal

body (104) is provided with a coating layer (204) onto which the polymer film (202) is bonded and/or wherein the metal body is anodized and/or bichromatized, the polymer film (202) is bonded to this anodized and/or bichromatized metal body (104).

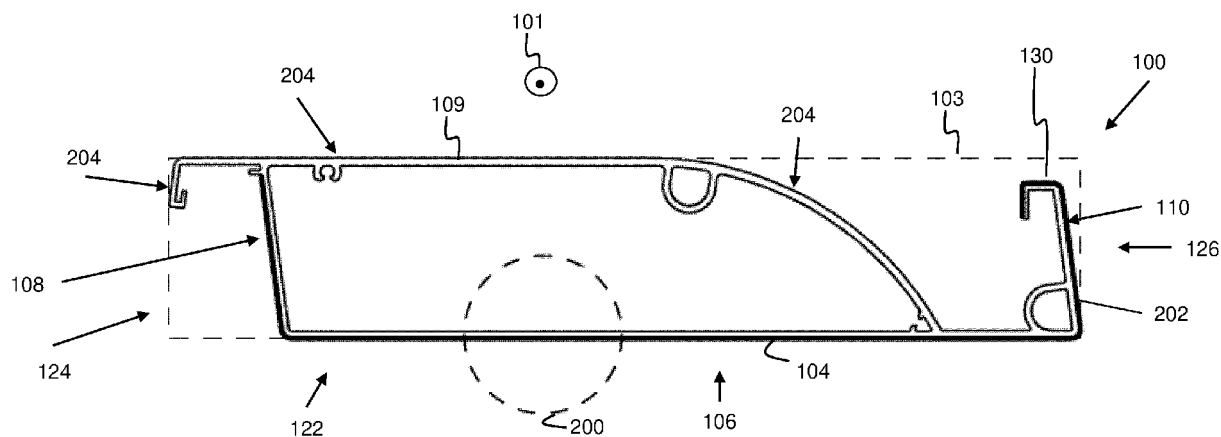


Fig. 1

Description

Technical field

[0001] The present invention relates to slats intended to form part of the roof of a covering, for example a pergola, and to methods of producing such slats.

Prior Art

[0002] The slats, intended to form part of the roof of a covering, for example a pergola, are usually manufactured via extrusion of aluminium, aluminium alloys or polymer, often PVC (polyvinyl chloride). The top side of the slat, directed upwards during use in a roof structure in the closed position of a covering, has to have different properties than the bottom side.

[0003] The top side has to withstand rain and moisture, and consequently must allow water and moisture to be discharged readily and completely, often simply through the action of the force of gravity. Remaining moisture should not be a source for the growth of moss or algae.

[0004] The bottom side, which often comprises a smooth surface, is preferably not excessively reflective. The extrusion lines which are often most visible on this bottom side, often where support ribs engage with the face which forms part of the bottom side on the inner side of the extruded profiled section, should preferably be concealed by the finishing layers.

[0005] The slats are typically finished with layers of powder coating. On the one hand, a structural coating is preferred because it conceals extrusion lines better and causes fewer reflections, if any. However, this structural coating tends to be coarse and does not entirely meet the requirements which the top side of the slat is expected to meet. Structural coating is also more scratch-resistant, as a result of which the coated slats are easier to handle during production and installation.

[0006] On the other hand, non-structural, matt or glossy, powder coatings are very smooth, as a result of which water drainage is facilitated and the growth of moss and algae is entirely or largely prevented. However, these coatings have the drawback that extrusion lines are concealed less well or not at all. The same applies to surfaces finished or treated by anodizing (surface provided with an oxide layer) and/or bichromatizing (also referred to as yellow or electrolytic galvanisation). Furthermore, such powder-coated, anodized or bichromatized surfaces cause more reflection.

[0007] Finishing slats by coating them with two different coatings, one on the top side and another on the bottom side, is difficult in practice, even impossible. Until now, slats intended to form part of the roof of a covering, for example a pergola, have typically been unicoloured. Such slats are known from EP3591136 or BE1026474.

Summary of the Invention

[0008] It is an object of the invention to provide an answer to the desire to manufacture slats intended to form part of the roof of a covering, for example a pergola, which offer a solution to the abovementioned problems.

[0009] There is also the desire to use slats in coverings, for example pergolas, which, in the closed position, have a matt, optionally decorative appearance on the visible bottom side, such as a stone or wood pattern, but provides good drainage on the top side and is hardly susceptible to the growth of moss and algae.

[0010] According to a first aspect of the invention, a slat intended to form part of the roof of a covering, for example a pergola, is provided.

[0011] A slat according to the first aspect of the invention and intended to form part of the roof of a covering, for example a pergola, comprises a metal body which comprises at least one face, characterized in that this face is coated with a polymer film, wherein the metal body is provided with a coating layer onto which a polymer film is bonded and/or wherein the metal body is anodized and/or bichromatized, the polymer film is bonded to this anodized and/or bichromatized metal body.

[0012] A slat according to some embodiments comprises a metal body which comprises at least one face, characterized in that this face is coated with a polymer film, wherein the metal body is provided with a coating layer onto which the polymer film is bonded or wherein the metal body is anodized and/or bichromatized, the polymer film is bonded to this anodized and/or bichromatized metal body.

[0013] The slats according to this first aspect of the invention have the advantage that the polymer film bonds better to the coated and/or anodized and/or bichromatized face of the metal body.

[0014] This face preferably extends in a longitudinal direction along the length of the slat. This face preferably forms part of the bottom side of the slat if the slat is used in a covering with rotatable slats and if the slats are in a closed position.

[0015] The bottom side of the slat, on which the polymer film is provided, may thus be provided with a film having properties such as mattness, decorative appearance or image, may optionally be structured or embossed, depending on the type and properties of the polymer film. This polymer film may also conceal the extrusion lines to a sufficient degree. The polymer film may impart the required properties to this side of the slat, irrespective of any coating used to coat the other surfaces of the slat.

[0016] According to a first important facet of this aspect of the invention, the metal body is first coated before the polymer film is applied.

[0017] According to some embodiments, the metal body may be provided with a coating layer to which the polymer film is bonded.

[0018] According to some embodiments, the coating

layer may be a powder coating layer.

[0019] According to some embodiments, the coating layer may be a non-structural coating layer.

[0020] This coating layer may be glossy or matt.

[0021] The coating layer, preferably a powder coating layer, is provided in an amount of preferably between 250 and 500 g/m. Preferably, the entire outer surface of the metal body is coated. This coating is preferably a non-structural coating, more preferably a glossy coating, this is a coating which is substantially smooth. This may be, for example, a high-gloss coating, which has a gloss of more than 70 GU, measured according to DIN EN ISO 2813 at a 20° angle of incidence. This may be, for example, a silky coating, which has a gloss of between 10 and 70 GU, measured according to DIN EN ISO 2813 at a 60° angle of incidence. The coating, preferably a powder coating layer, is a coating layer of polyester. The amount of coating applied preferably has a thickness of 0.15 to 0.25 mm.

[0022] According to some embodiments, the metal body may be anodized and/or bichromatized, the polymer film is bonded to this anodized and/or bichromatized metal body.

[0023] Anodizing means providing the surface with an oxide layer by means of an electrolytic treatment. Bichromatizing is also referred to as yellow or electrolytic galvanization.

[0024] The coating, if it is a non-structural coating, or the use of anodized or bichromatized surfaces, has the advantage that the surfaces of the slat, which are not coated with a polymer film, have a high smoothness. This stimulates the drainage of water when the slat is used as part of the roof of a pergola or covering. Consequently, these coated surfaces are also less susceptible to growth of algae or moss resulting from retention of residual moisture.

[0025] According to a second important facet of this aspect of the invention, the polymer film is bonded to the at least one face by means of adhesive.

[0026] According to some embodiments, the polymer film may be bonded to the at least one face by means of an adhesive.

[0027] According to some embodiments, the polymer film may be bonded to the at least one face by means of an adhesive, which adhesive is present in an amount of more than or equal to 10 g/m² (i.e. grams per square metre).

[0028] These slats have the advantage that the bonding between the metal body and the polymer film may compensate for the different expansion characteristics of the materials, and also bond well under moist conditions. This is particularly important when the slat is being used as part of a roof of a pergola or covering.

[0029] More preferably, the amount of adhesive is more than or equal to 15 g/m², such as in the range from 15 to 30 g/m², more preferably in the range from 15 to 25 g/m², for example from more than 20 g/m² to 25 g/m².

[0030] According to some embodiments, the adhesive

may be a hotmelt adhesive.

[0031] Preferably, these hotmelt adhesives are polyurethane-based adhesives.

[0032] Preferably, the adhesive is sprayed on, for example using a spray gun, or is applied (for example spread or pushed on) via a glue nozzle, although application by means of a roller or glue gun are alternatives. Optionally, the adhesive is first applied to the polymer film which is then brought into contact with the at least one face. If desired, a self-adhesive polymer film is used.

[0033] The coating layer which is positioned under the adhesive at the location of the polymer film may serve as a bonding layer or primer. If desired, a separate primer or activator is also applied to the coating layer which improves the bonding between the coating layer and the polymer film.

[0034] According to some embodiments, the metal body may be a body made of aluminium or an aluminium alloy.

[0035] This aluminium body (or made of an aluminium alloy) is preferably formed by extrusion of aluminium or the aluminium alloy.

[0036] In alternative embodiments, the metal may be iron or steel or any other similar metal. The metal body may be obtained by casting, extrusion or rolling.

[0037] The metal body comprises at least one face, being a smooth side. This face preferably provides the slat with its bottom side when in use as part of the roof of a pergola or covering. Preferably, the metal body has a top side and a bottom side, and two lateral sides which are oriented substantially perpendicular to the bottom side. The angle between the bottom side and lateral sides is preferably between 60 and 90°, for example between 70 and 90°. This angle is the smallest measurable angle between the faces. All sides and lateral sides are preferably parallel to one direction, being the axial direction of the slat, also referred to as the longitudinal direction. In cross section, i.e. in a section along a face perpendicular to this axial direction, the slat has a section which is circumscribed by a rectangle. Here, the term "circumscribed" means that the geometric figure, in this case a rectangle, has a maximum amount of points in common with the cross section. Preferably, the at least one side which is coated with a polymer film coincides with a large side of the circumscribing rectangle. The part of the side of the circumscribing rectangle, provided by the one face of the cross section of the slat, preferably has a length of more than 100 mm, for example between 110 mm and 350 mm, such as for example between 150 mm and 300 mm, such as 200 mm, 205 mm, 210 mm, 215 mm or 220 mm.

[0038] If desired, the metal body may also comprise one or more surfaces, for example faces, which adjoin the at least one face at an angle, and which are likewise coated in the same or similar way with an identical or similar polymer film.

[0039] According to some embodiments, the metal body may comprise one or more faces which adjoin the

at least one face at an angle and which are also coated with the same polymer film.

[0040] The expression "at an angle" is understood to mean that the faces or surfaces are not parallel. It will be clear that the resulting corner does not have to be a sharp corner, but may be a rounded corner having a relatively small radius, for example a radius of less than 12 mm, for example between 0.5 and 1.0 mm.

[0041] More preferably, the metal body also has two sides, preferably faces, which are perpendicular to the face coated with polymer film. Preferably, these two sides coincide with the short sides of the circumscribing rectangle, or one or more thereof are parallel with the short side of the circumscribing rectangle. Preferably, these two sides are also coated with the same polymer film. The amount of adhesive is preferably approximately equal to the amount of adhesive on the at least one side of the body of the slat which is coated with a polymer film. These sides preferably provide the slat with its visible lateral sides when used as part of the roof of a pergola or covering. These short sides of the circumscribing rectangle, possibly one or both provided by the two sides of the slat, preferably have a length of more than 30 mm, for example between 35 mm and 75 mm, such as for example between 35 mm and 50 mm.

[0042] When used as part of the roof of a pergola or covering, the top side of the slat is preferably provided by a surface which may be curved, i.e. which, in cross section, does not necessarily coincide completely with the second large side of the circumscribing rectangle. This top side may be coated with a polymer film in a similar or identical manner, but does not have to be. This side, just as possibly any other face of the slat, may be coated with a coating layer, for example a powder coating layer.

[0043] According to some embodiments, the polymer film may be a polymer film with a thickness of between 150 and 260 μm , for example between 153 and 256 g/m^2 . More preferably, the polymer film has a thickness of between 180 and 240 μm , for example between 184 and 235 g/m^2 .

[0044] A polymer film is understood to mean a thin layer which is sufficiently flexible to be glued onto the at least one face of the slat and, if desired, also to other sides and surfaces of the slat. The film which is made of polymer means that the film to a large degree consists of a layer of polymer and also comprises, if desired, an adhesive or bonding layer on the one side and/or a decorative image and/or a finishing layer or layers on the other side which provides the film with further properties.

[0045] According to some embodiments, the polymer film may be a polyvinyl chloride film.

[0046] Preferably, the tensile strength of the film is greater than 19 MPa.

[0047] Preferably, the film has a coefficient of expansion of more than 2.5% (10 min/60°C).

[0048] Preferably, the weight per unit area of the film is greater than 200 g/m^2 , for example approximately 225

g/m^2 .

[0049] According to some embodiments, the polymer film may be provided with a decorative image. This decorative image may preferably be an image which represents a wood or stone structure. This decorative image may be a faithful rendition of real wood or stone.

[0050] This decorative image may be provided on the polymer film in any way, for example by (digital or rotatory) printing, contact printing and the like.

[0051] The polymer film may be provided with a structure, i.e. a relief, on its outwardly facing side. This relief may be provided by imprinting the outer surface of the polymer film, also referred to as embossing. This relief may form the same or a similar relief image as the image of the decorative layer. This relief, if similar or identical to the decorative image, may coincide with this decorative image (embossed in register) or may not be in register. This embossing, particularly when it is in register, produces a more lifelike representation of the decorative image, in particular in case of a decorative image of wood or stone.

[0052] According to a third important facet of this aspect of the invention, the polymer film has a limited gloss value.

[0053] According to some embodiments, the polymer film may have a gloss value of less than or equal to 10 GU, for example less than 7 GU, measured according to DIN EN ISO 2813 at an angle of incidence of 85°.

[0054] Preferably, the polymer film has a gloss value of less than or equal to 10 GU, for example less than or equal to 5 GU, in each case measured according to DIN EN ISO 2813 at an angle of incidence of 85°.

[0055] As a result, a slat is provided which, in use, displays the decorative aspect on one of the sides of the slat more clearly at varying incidence of light, for example by rotating the slat which forms part of a covering, for example a pergola, in which the slats are arranged so as to be rotatable.

[0056] Slat according to this aspect of the invention may furthermore be provided with a sealing on the sides of the slat. These sealings are intended to cooperate with adjacent slats in a structure, for example a roof structure, in order to make the roof structure watertight.

[0057] Slat according to the first and/or second aspect of the invention may furthermore be provided with a rotation mechanism in order to allow the slats in a roof structure to be rotatable (or pivotable) about an axle of rotation. In this way, the slats may be turned in order to allow more or less, and even no light through the roof structure.

[0058] According to a second aspect of the invention, a covering is provided comprising a roof structure.

[0059] A covering according to this second aspect comprises a roof structure, which roof structure comprises more than one slat according to one or more facets of the first aspect of the invention.

[0060] According to some embodiments, the covering may be a pergola.

[0061] According to some embodiments, the slats may be arranged so as to be pivotable about their axis of rotation, the face which is coated with a polymer film provides the slats with their bottom sides when the covering is brought to the closed position.

[0062] The axis of rotation is typically an axis in the longitudinal direction of the slat.

[0063] A covering according to this third aspect of the invention comprises more than one slat according to the first and/or second aspect of the invention. The slats, for example more than 2 slats, for example more than 5, more than 10, more than 15 or more than 20 slats, are installed side by side and are optionally provided with a sealing between two adjacent slats.

[0064] Preferably, the faces which face upwards when the covering has been brought to the closed position are provided with a glossy coating layer. This improves the water drainage in case of rain or precipitation.

[0065] According to a third aspect of the present invention, a method is provided for manufacturing slats suitable for use as part of a covering, for example a pergola.

[0066] The method according to this third aspect, which method is a way of manufacturing slats suitable for use as part of a covering, for example a pergola, comprises the following steps:

- a. providing a metal body which comprises at least one face, which face is parallel with the axial direction of the metal body;
- b. providing a polymer film on this face and providing an adhesive between the film and the face;
- c. pressing the polymer film onto the face, in which case the pressure point initially acts substantially in the centre of the intersecting line of the face cut along a plane of intersection perpendicular to the axial direction, and in which case the pressure points move gradually or step by step to the lateral side of the one face.

[0067] The adhesive may be applied to this at least one face or to the adhesive side of the polymer film.

[0068] During the pressing down, it is ensured that the entire face of the at least one face is pressed down at least once. This may be achieved, for example, by guiding the slat over a conveying device, for example a roller conveyor, and allowing a series of successive pressure-exerting rollers to press down on the at least one face. The successive rollers are arranged in such a way that the pressure moves step by step from the centre of the at least one face to the lateral side of the at least one face. Each successive roller pushes down on a zone which is adjacent to the previous pressure zone or, if desired, partly overlaps the latter.

[0069] It is possible for step d to ensure the contact between the polymer film and the face by using an initial pressure-exerting roller which acts across the entire width of the face.

[0070] After the pressing-down operation, any excess

adhesive is removed.

[0071] According to some embodiments, the adhesive may be applied in an amount of more than or equal to 10 g/m².

5 **[0072]** More preferably, the amount of adhesive is more than or equal to 15 g/m², such as in the range from 15 to 30 g/m², more preferably in the range from 15 to 25 g/m², for example from more than 20 g/m² to 25 g/m².

10 **[0073]** Preferably, the adhesive is a hotmelt adhesive, for example a polyurethane-based adhesive.

[0074] According to some embodiments, at least the one face of the metal body may first be provided with a coating layer before the adhesive is applied.

15 **[0075]** According to some embodiments, the metal body may comprise one or more faces which adjoin the at least one plane at an angle, the method furthermore comprising the steps of folding the polymer film so that it makes contact with the one or more faces and pressing the polymer film down onto the one or more faces.

20 **[0076]** When pressing down the polymer film onto the one or more faces, it is preferably ensured that the pressure point initially engages near the folding line and subsequently, the pressure points will gradually or step by step move away from the folding line along the one or

25 more faces.

[0077] Optionally, further outer surfaces of the metal body, for example the entire outer surface of the metal body, may be provided with this coating layer. Preferably, this coating layer is a powder coating layer, most preferably a glossy powder coating layer. The coating layer which is situated under the adhesive at the position of the polymer film may act as a bonding layer or primer. Optionally, a separate primer or activator is additionally applied to the coating layer which improves the bonding between the coating layer and the polymer film.

30 **[0078]** The pressure points used to exert a pressure on the film applied to at least the at least one face of the metal body are preferably provided by pressure rollers under which the metal body of the slat is moved forward, for example by a roller conveyor. The pressure rollers are positioned in such a way in the direction of production of the slat that the pressure points are gradually moved from the centre of the one face outwards.

35 **[0079]** The way of displacing the pressure points according to this aspect of the invention is advantageous because it facilitates the spreading of the adhesive across the surface of the face and makes it more even and uniform.

40 **[0080]** Preferably, slats are produced in a continuous manner, in which case a metal body which is long in the axial direction is provided with the polymer film, following which the slats are shortened to length, for example by cutting.

45 **[0081]** A metal body may be provided, for example, by rolling or extruding a metal volume, for example by extruding aluminium or an aluminium alloy.

[0082] Characteristic features as described in the context of embodiments of the first and/or second aspect of

the invention may be combined with this third aspect of the invention.

[0083] According to a fourth aspect of the invention, a slat is provided which has been obtained by the method according to the third aspect of the invention. This slat may also have all the characteristic features of a slat according to the first aspect of the invention. These slats according to the fourth aspect of the invention may be used as an element in a roof structure of a covering, for example a covering according to the second aspect of the invention.

[0084] The independent and dependent claims describe specific and preferred characteristic features of the embodiments of the invention. Characteristic features of the dependent claims may be combined with characteristic features of the independent and dependent claims, or with characteristic features described above and/or below in any suitable manner, as will be clear to someone skilled in the art.

[0085] The above and other characteristic features, properties and advantages of the present invention will be explained by means of the following examples of embodiments, optionally in combination with the drawings.

[0086] The description of these examples of embodiments is provided for clarification and is not intended to limit the scope of the invention. The reference numerals in the following description refer to the drawings. Identical reference numerals in possibly different figures refer to identical or similar elements.

[0087] Where reference is made to ranges of values, these ranges are inclusive, i.e. include the mentioned end values of the range, unless indicated otherwise.

Short Description of the Drawings

[0088] In order to show the characteristic features of the invention in more detail, some preferred embodiments are described below by way of example and without being limited thereto, with reference to the accompanying drawings, in which:

- Fig. 1 diagrammatically illustrates a cross section of a slat according to the first aspect of the invention;
- Fig. 2 diagrammatically illustrates a detail of the slat from Fig. 1;
- Fig. 3 diagrammatically shows a production process according to the invention.

Description of Embodiments

[0089] The present invention is described below by means of specific embodiments.

[0090] A section of a slat 100, which section is taken through a cut surface perpendicular to the axial direction 101 of the slat, being the longitudinal direction, is shown in Fig. 1. The section along this face generates a slat section, which is circumscribed by rectangle 103.

[0091] A detail 200 of the face 106 is shown in Fig. 2.

[0092] The slat 100 is intended to form part of the roof of a covering, for example a pergola. The slat comprises a metal body 104 which comprises at least one face 106. This face partly coincides with a large side of the rectangle 103. The slat furthermore comprises two lateral faces 108 and 110 which are substantially perpendicular to this face 106 and which are virtually parallel to the short side of the rectangle 103. The angle between face 108 and 110, on the one hand, and face 106, on the other hand, is between 75 and 90°. Lateral faces 108 and 110 form a corner with face 106, which corner is more of a rounded corner with a radius of approximately 2.5 mm. Finally, the section also comprises a top side 109. This face partly coincides with another large side of the rectangle 103.

[0093] The faces 106, 108 and 110 are coated with a polymer film 202 (see Fig. 2 in detail) which is bonded to the at least one face by means of an adhesive. The adhesive is present in an amount of 20 g/m².

[0094] The adhesive is preferably applied by spraying.

[0095] Detail 200 shows a detail of the construction of the metal body 104 which is coated with a polymer film 202 on this side. A powder coating layer 204 is first provided on the metal body, to which an activator 208 bonds first, followed by the adhesive 206, which in turn bonds to the polymer film 202.

[0096] The powder coating layer 204 is a glossy, non-structural powder coating layer with excellent weather-proof and scratch-resistant properties. For example, a powder-coating layer of Axalta, RAL colour 9005 G Jet Black or a powder-coating layer of Axalta, RAL colour 9016 G Traffic White, both with a gloss type "Gloss", are used. The amount of powder coating is approximately 400 g/m².

[0097] The metal body 104 is manufactured from aluminium by extrusion.

[0098] This coating layer 204 is provided with an activator 208 and then with a hotmelt adhesive 206. The adhesive used is a polyurethane-based hotmelt, for example Kleiberit 704.

[0099] The polymer film 202 is a PVC film, for example a PVC film provided with relief, finished on the top side with an acrylic coating, in turn provided with an external coating of PVDF (polyvinylidene fluoride). For example, a "Woodec" film manufactured by Konrad Hornschuch AG (DE) may be used. On the outward-facing side 220, the polymer film is provided with a decorative image which represents a wood pattern. The film is also provided with a relief which is in register with the image of the wood pattern. The gloss value or gloss level of this side 220 is less than or equal to 5, measured according to DIN EN ISO 2813.

[0100] The side 106 provides the slat in its bottom side 122, in use, as an element of a roof structure of a covering, for example a pergola.

[0101] The sides 108 and 110 provide the slat with its lateral sides 124 and 126. As is illustrated in Fig. 1, the polymer film 202 is applied across the entire surface of the face 104, across the entire surface of the side 110

and across virtually the entire side 108. On the side 110, the slat is in addition provided with an inwardly directed corner 130. In this embodiment, this corner is also provided with the polymer film 202 on its side which is directed to the exterior of the slat.

[0102] On the outwardly directed side, the top side 109 is not provided with the polymer film, but the outer side is provided by the coating layer 204.

[0103] The slat 100 has a good resistance to thermal expansion and contraction, with the film not, or hardly, becoming detached during normal use. In addition, after such slats have been installed in a pergola, where the slats are arranged so as to be rotatable along the axial direction of the slats, the decorative design, in this case a wood pattern, will remain visible due to the mattness of the film. Reflection of sunlight onto adjacent slats or other objects will not have any or only a small unpleasant effect. The glossy coating layer on the side 109 ensures good drainage and limits the growth of moss and algae.

[0104] The production of a slat 100 is illustrated diagrammatically in Fig. 3.

[0105] In a first step 400, a metal body is provided which comprises at least one face, which face runs parallel with the axial direction of the metal body. This is possible, for example, by extruding aluminium to produce this shape.

[0106] Subsequently, the outer side of this metal body is powder-coated with powder 204 in step 401, as has been described above, so that approximately 400 g/m² powder coating is present on the outer surface. This results in a glossy, non-structural coating layer.

[0107] Subsequently, an adhesive, being a hotmelt adhesive 206 of the type described above, is applied to the polymer film (not shown in Fig. 3) in step 402. Application is effected by passing the film under a glue nozzle, which nozzle emits adhesive which is thus applied to the surface of the film. The amount of adhesive is approximately 20 g/m². An activator 208 is applied to the face 106, and also the faces 108, 110 and 130 (see Fig. 3).

[0108] Then the polymer film 202 provided with adhesive is applied to the faces in step 403. Contact between polymer film and face 106 is optionally initially achieved by lightly pressing the polymer film down onto this face 106 by means of a roller 401 which runs the entire width of face 106.

[0109] This is followed by pressing down the film 202 on the face, diagrammatically illustrated in steps 404a to 404c, wherein the pressure point 301 initially acts substantially in the centre 303 of the intersecting line of the face cut along a plane of intersection perpendicular to the axial direction, and wherein the pressure points move gradually or step by step to the lateral side of the one face. The slat is passed over a roller conveyor in a longitudinal direction, and a series of successive pressure rollers in each case press down on a part of the surface of face 106. The pressure points or surfaces are adjacent to each other and optionally overlap. For the sake of simplicity, only three of such non-successive pressing sta-

tions are drawn in steps 404a to 404c, but in reality between 25 and 50 pressing stations are used.

[0110] In case the film is also present on the lateral sides of the slat, the film is then pressed down on the lateral sides in step 405 and optionally in step 406.

[0111] All the pressing-down action is performed by pressure rollers 305 and the pressure which is applied to press down the film is in the order of magnitude of approximately 5 kg per pressure roller.

[0112] When the film has been pressed down, any excess adhesive is removed and any excess film is cut off.

[0113] It will be clear that, although the embodiments and/or the materials for providing embodiments according to the present invention have been described, various modifications or changes may be made without departing from the area of operation and/or the spirit of this invention. The present invention is by no means limited to the above-described embodiments, but may be achieved according to different variants without departing from the scope of the present invention.

[0114] Although the present invention has been illustrated by means of specific embodiments, it will be clear to the person skilled in the art that the invention is not limited to the details of the above illustrative embodiments and that the present invention may be carried out with various changes and modifications without departing from the area of application of the invention. The present embodiments therefore have to be regarded as being illustrative and nonlimiting in all aspects, with the area of application of the invention being delimited by the attached claims and not by the above description, and any modifications which fall within the meaning and scope of the claims are therefore deemed to be incorporated herein. In other words, it is assumed that this covers all modifications, variations or equivalents which fall within the area of application of the underlying basic principles and whose essential attributes are claimed in this patent application. In addition, the reader of this patent application will understand that the words "comprising" or "comprise" do not exclude other elements or steps, that the word "a(n)" does not exclude the plural and that a single element, such as a computer system, a processor or another integrated unit, may perform the functions of different ancillary means which are mentioned in the claims. Any references in the claims should not be interpreted as a limitation of the respective claims. The terms "first", "second", "third", "a", "b", "c" and such, when used in the description or in the claims, are used to distinguish between similar elements or steps and do not necessarily describe a sequential or chronological order. Similarly, the terms "top side", "bottom side", "over", "under" and the like are used to aid the description and do not necessarily refer to relative positions. It should be understood that these terms are interchangeable under the right circumstances and that embodiments of the invention can function according to the present invention in different sequences or orientations than those described or illustrated above.

Claims

1. Slat intended to form part of the roof of a covering, for example a pergola, comprising a metal body which comprises at least one face, **characterized in that** this face is coated with a polymer film, wherein the metal body is provided with a coating layer onto which the polymer film is bonded and/or wherein the metal body is anodized and/or bichromatized, the polymer film is bonded to this anodized and/or bichromatized metal body. 5
2. Slat according to Claim 1, wherein the metal body is provided with a coating layer to which the polymer film is bonded. 10
3. Slat according to Claim 2, wherein the coating layer is a powder coating layer. 15
4. Slat according to Claim 2 or 3, wherein the coating layer is a non-structural coating layer. 20
5. Slat according to Claim 1, wherein the metal body is anodized and/or bichromatized, the polymer film is bonded to this anodized and/or bichromatized metal body. 25
6. Slat according to one of the preceding claims, wherein the metal body is a body made of aluminium or an aluminium alloy. 30
7. Slat according to one of the preceding claims, wherein the metal body comprises one or more faces which adjoin the at least one face at an angle and which are also coated with the same polymer film. 35
8. Slat according to one of the preceding claims, wherein the polymer film is a polymer film with a thickness of between 150 and 260 μm . 40
9. Slat according to one of the preceding claims, wherein the polymer film is provided with a decorative image. 45
10. Slat according to one of the preceding claims, wherein the polymer film has a gloss value of less than or equal to 10, measured according to DIN EN ISO 2813 at an angle of incidence of 85° . 50
11. Covering comprising a roof structure, which roof structure comprises more than one slat according to one of the preceding claims. 55
12. Covering according to Claim 11, wherein the covering is a pergola.
13. Covering according to one of Claims 11 to 12, wherein the slats are arranged to as to be pivotable about their axis of rotation, the face which is coated with a polymer film provides the slats with their bottom sides when the covering is brought to the closed position.
14. Method for manufacturing slats suitable for use as part of a covering, for example a pergola, comprising the following steps:
 - a. providing a metal body which comprises at least one face, which face is parallel with the axial direction of the metal body;
 - b. providing a polymer film on this face and providing an adhesive between the film and the face;
 - c. pressing the polymer film onto the face, in which case the pressure point initially acts substantially in the centre of the intersecting line of the face cut along a plane of intersection perpendicular to the axial direction, and in which case the pressure points move gradually or step by step to the lateral side of the one face.
15. Method according to Claim 14, wherein the metal body comprises one or more faces which adjoin the at least one face at an angle, the method furthermore comprising the steps of folding the polymer film so that it makes contact with the one or more faces and pressing the polymer film down onto the one or more faces.

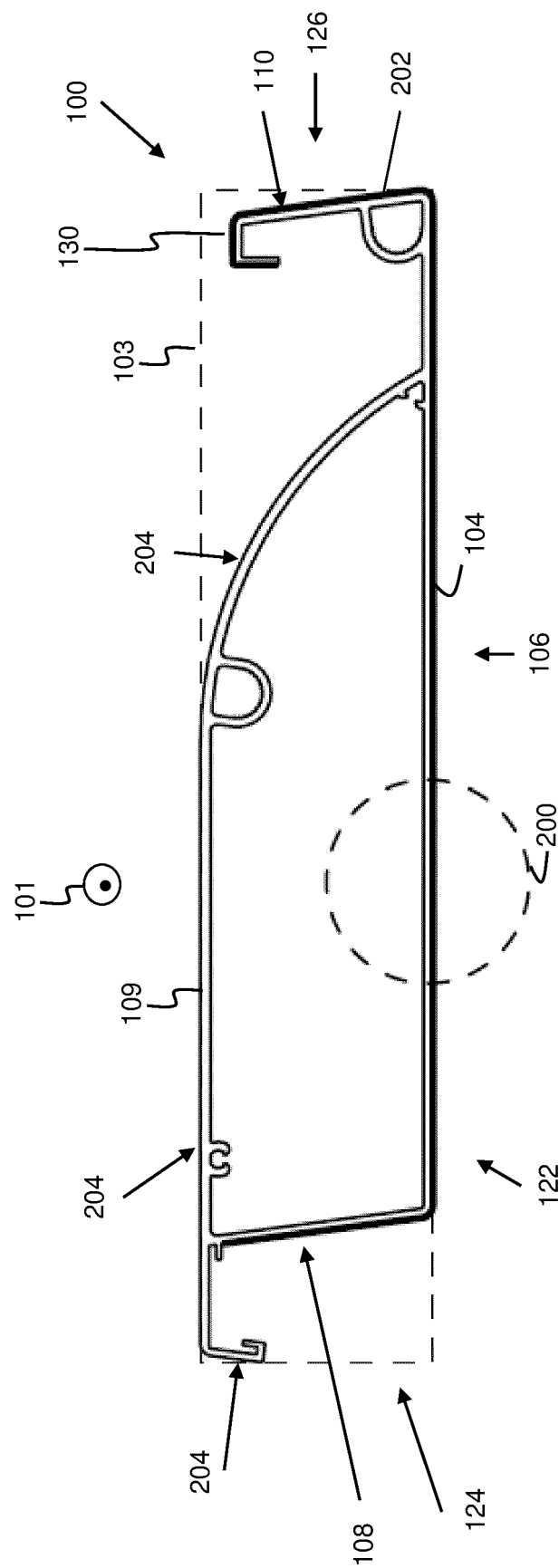


Fig. 1

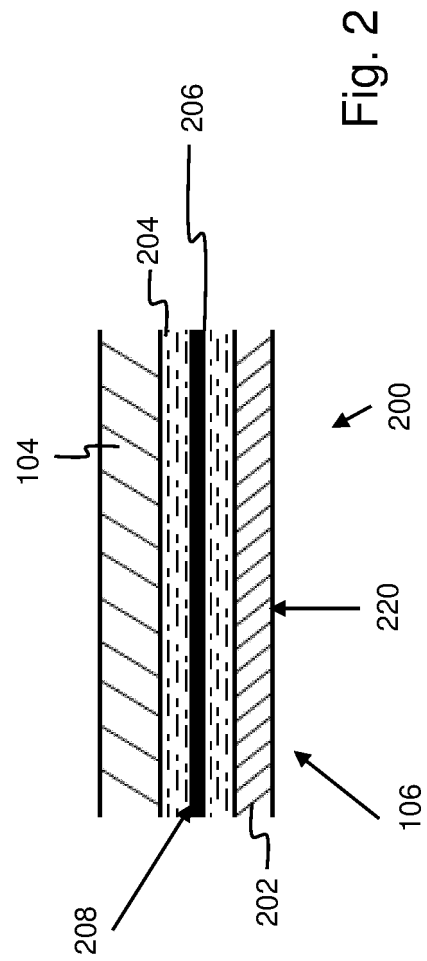


Fig. 2

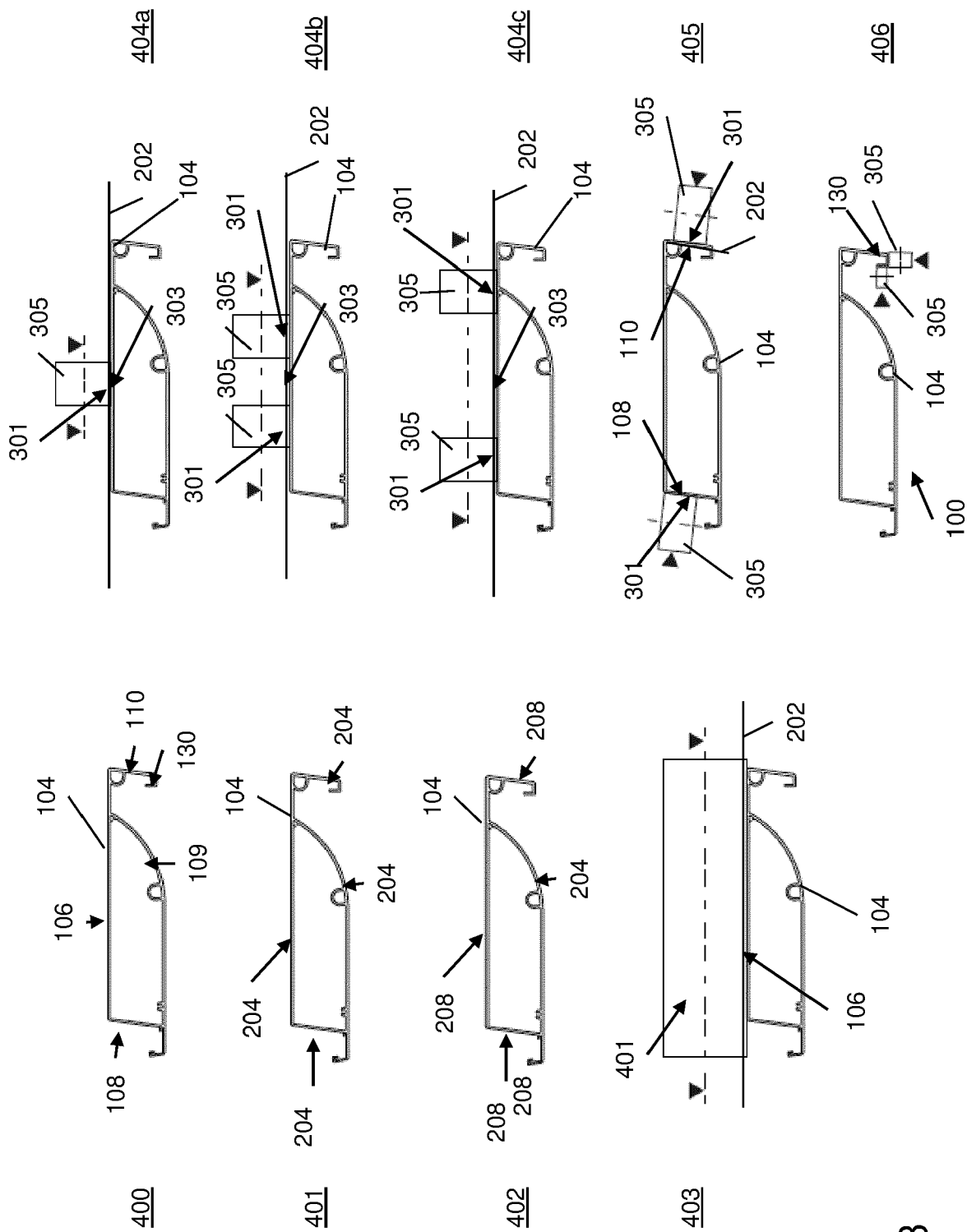


Fig. 3



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Application Number
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The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 30 September 2021	Examiner Merz, Wolfgang
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