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(54) **TEXTILE MADE OF THREADS WITH DIFFERENT PROPERTIES FOR COVERING AN OPENING IN A BUILDING**

TEXTIL AUS FÄDEN MIT UNTERSCHIEDLICHEN EIGENSCHAFTEN ZUM VERSCHLIESSEN
EINER GEBÄUDEÖFFNUNG

TEXTILE COMPORTANT DES FILS AYANT DIFFÉRENTES PROPRIÉTÉS POUR OBTURER UNE
OUVERTURE DE BÂTIMENT

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Description

Technical field

[0001] This invention relates to a shielding element for building or civil works (for example, associated with outside walls of homes or places of work) to protect the buildings or civil works from external environmental agents and/or weathering.

Background art

[0002] As is known, controlling the illumination and/or conditioning of rooms having windows or openings for the passage of light from the exterior is usually accomplished by means of appropriate shielding structures, of various sizes, whose purpose, generally speaking, is to filter or "divide" the solar radiation - in terms of both light and energy - admitted through the windows themselves.

[0003] Shielding elements for residential, commercial or public buildings may, in particular, be made of woven structures made from any of a wide variety of materials: for example, shielding elements may be made of natural or synthetic textiles or of metallic materials.

[0004] The prior art shielding elements mentioned above, although widespread and extensively used, have some disadvantages.

[0005] In particular, shielding elements made of a single type of material in fact provide only a partial shield against solar radiation and, moreover may prove to be deficient in mechanical performance (for example, when shielding elements need to be installed in areas subject to persistently strong winds or non-negligible quantities of erosive agents such as dust or other airborne particles).

[0006] Furthermore, prior art shielding elements, when they are made of plastic/polymeric material, may have optical and thermal properties which are not satisfactory in terms of absorption, filtration, refraction and redistribution of incident sunlight, or sunlight from the exterior.

[0007] Moreover, some prior art types of metallic shielding elements (for example, Venetian blinds and louvres) do not allow a satisfactory view of the outside, whilst other prior art types of metallic shielding elements (for example, metal gratings) provide a high level of protection from the sun but maintain high light transmission and thus cannot guarantee satisfactory visual comfort.

[0008] A customary shielding element comprising the features as mentioned in the preamble of claim 1 is described in US 1 983 617 A.

Disclosure of the invention

[0009] This invention therefore has for an aim to provide a shielding element for building or civil works which overcomes at least the above mentioned disadvantages (and which possibly offers a higher level of functionality than what is available in the state of the art).

[0010] In particular, the aim of this invention is to create a shielding element which offers significant improvement features in terms of weathering resistance and construction quality, even in very large installations and/or in environments which are highly aggressive in terms of luminosity and/or weather and/or solar radiation.

[0011] The invention also intends to provide a shielding element which can guarantee improved quality control of sunlight from the exterior in terms of filtration and/or diffusion and/or refraction, in order to (for example) improve both the intensity and the colour distribution of the natural light inside a room while maintaining at a high level the property of reducing incoming heat.

[0012] Another aim of the invention is to provide a shielding element that is substantially competitive in economic terms compared to prior art products, while at the same time offering all of the other advantages mentioned above.

[0013] These aims as mentioned above are achieved by a shielding element for building and/or civil works according to one or more of the claims appended hereto.

Detailed description of the preferred embodiments of the invention

[0014] The shielding element according to the invention is installable (for example but without limiting the invention) on the outside of building and/or civil works and is based substantially on a fabric structure of interwoven weft and warp thread-like elements.

[0015] The fabric structure comprises at least a first subgroup of thread-like elements (which may be in the weft and/or the warp) made of a first material having a first group of mechanical and/or optical identification parameters, and at least a second subgroup of thread-like elements (which may also be in the weft and/or the warp) made of a second material having a second group of mechanical and/or optical identification parameters: the parameters of the second subgroup are different, at least in terms of quantity, from the corresponding parameters of the first group. The differentiation of the mechanical properties between the two subgroups of thread-like elements advantageously makes it possible to obtain high mechanical properties for the shielding element as a whole without creating the excessive stiffness of a fabric made entirely of substantially "stiff" materials, such as, for example, a 100% metal wire cloth.

[0016] At the same time, the differences in the surface properties of the thread-like elements of the two subgroups allow reflecting surfaces and "opaquing" surfaces to be distributed within the shielding element: that translates as a vast range of possibilities of controlling the light which is reflected and/or refracted and/or diffracted and/or diffused through the woven structure. This gives considerable control over the sunlight which penetrates the rooms shielded by the element according to the invention, in terms of both quality (that is, wavelengths which are visible or invisible, absorbed or allowed to

"pass through") and quantity (that is, total intensity of the natural illumination that reaches the interior of the shielded room).

[0017] The thread-like elements belonging to the first subgroup have optical properties of at least partial attenuation and/or absorption of environmental light rays (and typically may be optically opaque to visible light radiation), whilst the thread-like elements belonging to the second subgroup have optical properties of reflection and/or diffraction of environmental light rays (and typically may be optically reflective and/or non-absorptive of visible light radiation).

[0018] The thread-like elements of the first subgroup are made of a polymeric or "composite" material (for example, polyester and/or polyamide and/or glass fibre depending on the requirements of the moment), whilst the thread-like elements of the second subgroup might be made of a metallic material (for example, aluminium and/or aluminium alloy, depending on the requirements of the moment).

[0019] The choice of combining polymeric and metallic materials in the fabric structure of the shielding element according to the invention thus makes it possible to rely on the considerable structural capabilities of the metals without losing the properties of flexibility and deformability which can be conferred by the polymers: that makes the shielding element particularly suitable for applications on the outside of buildings, even extending over large areas and/or on movable frames (or on reels).

[0020] Conveniently, for applications with special weather resistance requirements, the thread-like elements of the first subgroup may have a coating composed of PVC.

[0021] At another level of structural detail, it may be observed that in some embodiments of this invention, the thread-like elements belonging to the first subgroup have a substantially circular cross section and are, in this geometrical configuration, between 0.30 mm and 0.60 mm in diameter.

[0022] As to the thread-like elements belonging to the second subgroup, it may be noted that these have a substantially circular cross section and are, in turn, between 0.20 mm and 0.50 mm in diameter.

[0023] The thread-like elements belonging to the first and/or the second subgroup might also have a cross section of a shape other than the circular shape just mentioned: for example, the thread-like elements belonging to the first and/or the second subgroup might be planar/plate-shaped in cross section (known as "flat wires" in the jargon of the trade). In this configuration, the thread-like elements of the second subgroup may be between 0.10 mm and 0.40 mm thick.

[0024] In terms of overall mass, this invention may be embodied in different ways, according to the weave pattern, compactness and percentage of the two different materials used for the two subgroups of thread-like elements: for example, in some embodiments of the invention, the first subgroup comprises thread-like elements

defining a variable percentage of between 40% and 60% of the overall weight of the shielding element, whilst the second subgroup comprises (in a manner preferably complementing the weight percentages just mentioned) thread-like elements defining a variable percentage of between 60% and 40% of the overall weight of the shielding element.

[0025] By varying the above mentioned percentages as required, it is in any case possible to obtain a total specific weight per unit area of the shielding element of between 400 g/m² and 1600 g/m².

[0026] When installing the shielding element according to the invention, the required flexibility and adaptability can be obtained using suitable delimiting and supporting means, which are associated with the shielding elements and which are, generally speaking, designed to define a perimeter thereof.

[0027] Depending on the requirements of the moment, the delimiting and supporting means may consist of diverse, fixed, movable or articulated structures, allowing the shielding element to be translated and/or rotated and/or rolled up.

[0028] The invention achieves interesting advantages.

[0029] First of all, it should be stressed that the basic constructional architecture of this shielding element significantly increases structural efficiency without, however, losing in flexibility/elasticity, rollability or structural flatness/consistency, even in the case of very large overall installed dimensions.

[0030] At the same time, the combined presence and functional cooperation of the two different types of material making up the fabric structure guarantees optimum utilization of the respective optical and energy properties which in turn allows improved filtering and reduction of solar radiation "peaks" (while, on the other hand, preventing excessive darkening of the room protected by the shielding element itself).

[0031] Lastly, it should be stressed that, in all of its possible embodiments and in a practically infinite range of surface dimensions, the invention can be made with materials and machinery which are readily and easily available on the market at a low cost, thereby achieving low costs of purchase, management and maintenance.

Claims

1. A shielding element for building and/or civil works, the shielding element comprising a fabric structure of interwoven thread-like elements, said fabric structure comprises at least a first subgroup of thread-like elements made of a first material having a first group of mechanical and/or optical identification parameters, and at least a second subgroup of thread-like elements made of a second material having a second group of mechanical and/or optical identification parameters, the mechanical and/or optical parameters of the second subgroup of thread-like elements

differing in quantity from the corresponding mechanical and/or optical parameters of the first subgroup; wherein the thread-like elements belonging to the first subgroup have optical properties of at least partial attenuation and/or absorption of environmental light rays, the thread-like elements of the first subgroup being optically opaque to visible light radiation, and wherein the thread-like elements belonging to the second subgroup have optical properties of reflection and/or diffraction of environmental light rays, the thread-like elements of the second subgroup being optically reflective and/or non-absorptive of visible light radiation;

characterised in that

the shielding element is installable on the outside of the building and/ or civil works in order to protect the building and/or civil works from external environmental agents and/or weathering, wherein the thread-like elements of the first subgroup are made of a polymeric or composite material.

2. The shielding element according to claim 1, wherein the polymeric material is polyester and/or polyamide or the composite material is glass fibre, the thread-like elements of the first subgroup having preferably a coating comprising PVC.
3. The shielding element according to any of the preceding claims, wherein the thread-like elements of the second subgroup are made of a metallic material, the metallic material being preferably aluminium and/or aluminium alloy.
4. The shielding element according to any of the preceding claims, wherein the thread-like elements belonging to the first subgroup have a substantially circular cross section and are preferably between 0.30 mm and 0.60 mm in diameter.
5. The shielding element according to any of the preceding claims, wherein the thread-like elements belonging to the second subgroup have a substantially circular cross section and are preferably between 0.20 mm and 0.50 mm in diameter.
6. The shielding element according to any of the preceding claims, wherein the thread-like elements belonging to the first and/or the second subgroup are planar/plate-shaped in cross section and are preferably between 0.10 mm and 0.40 mm thick.
7. The shielding element according to any of the preceding claims, wherein the first subgroup comprises thread-like elements defining a variable percentage of between 40% and 60% of the overall weight of the shielding element, the second subgroup complementarily comprising thread-like elements defining a variable percentage of between 60% and 40% of

the overall weight of the shielding element, a total specific weight per unit area of the shielding element being between 400 g/m² and 1600 g/m².

8. The shielding element according to any of the preceding claims, further comprising delimiting and supporting means associated with the shielding element and designed to define a perimeter thereof, the delimiting and supporting means being preferably designed to allow the shielding element to be translated and/or rotated and/or rolled up.

Patentansprüche

1. Abschirmungselement für Gebäude und/oder Bauwerke, wobei das Abschirmungselement eine Textilstruktur von miteinander verwobenen fadenähnlichen Elementen umfasst, wobei die Textilstruktur mindestens eine erste Untergruppe von fadenähnlichen Elementen umfasst, die aus einem ersten Material bestehen, aufweisend eine erste Gruppe mechanischer und/oder optischer Identifizierungsparameter, und mindestens eine zweite Untergruppe von fadenähnlichen Elementen, die aus einem zweiten Material bestehen, aufweisend eine zweite Gruppe mechanischer und/oder optischer Identifizierungsparameter, wobei sich die mechanischen und/oder optischen Parameter der zweiten Untergruppe fadenähnlicher Elemente in der Menge von den entsprechenden mechanischen und/oder optischen Parametern der ersten Untergruppe unterscheiden, wobei die fadenähnlichen Elemente, die zur ersten Untergruppe gehören, optische Eigenschaften betreffend mindestens die teilweise Abschwächung und/oder Adsorption von Umgebungslichtstrahlen aufweisen, wobei die fadenähnlichen Elemente der ersten Untergruppe optisch undurchlässig für sichtbare Lichtstrahlung sind und wobei die fadenähnlichen Elemente, die zur zweiten Untergruppe gehören, optische Eigenschaften betreffend die Reflexion und/oder Beugung von Umgebungslichtstrahlen aufweisen, wobei die fadenähnlichen Elemente der zweiten Untergruppe optisch reflektierend sind und/oder sichtbare Lichtstrahlung nicht absorbieren, **dadurch gekennzeichnet, dass** das Abschirmungselement an der Außenseite des Gebäudes und/oder Bauwerks montiert werden kann, um das Gebäude und/oder Bauwerk vor externen Umwelteinflüssen und/oder Witterungseinflüssen zu schützen, wobei die fadenähnlichen Elemente der ersten Untergruppe aus einem Polymer- oder Verbundmaterial bestehen.
2. Abschirmungselement nach Anspruch 1, wobei das Polymermaterial Polyester und/oder Polyamid ist oder das Verbundmaterial Glasfaser ist, wobei die fadenähnlichen Elemente der ersten Untergruppe

vorzugsweise eine Beschichtung umfassend PVC aufweisen.

3. Abschirmungselement nach einem der vorhergehenden Ansprüche, wobei die fadenähnlichen Elemente der zweiten Untergruppe aus einem Metallmaterial bestehen, wobei das Metallmaterial vorzugsweise Aluminium und/oder Aluminiumlegierung ist. 5
4. Abschirmungselement nach einem der vorhergehenden Ansprüche, wobei die fadenähnlichen Elemente, die zur ersten Untergruppe gehören, einen im Wesentlichen kreisförmigen Querschnitt und vorzugsweise einen Durchmesser zwischen 0,30 mm und 0,60 mm aufweisen. 10
5. Abschirmungselement nach einem der vorhergehenden Ansprüche, wobei die fadenähnlichen Elemente, die zur zweiten Untergruppe gehören, einen im Wesentlichen kreisförmigen Querschnitt und vorzugsweise einen Durchmesser zwischen 0,20 mm und 0,50 mm aufweisen. 15
6. Abschirmungselement nach einem der vorhergehenden Ansprüche, wobei die fadenähnlichen Elemente, die zur ersten und/oder zur zweiten Untergruppe gehören, ebenflächig/plattförmig im Querschnitt und vorzugsweise zwischen 0,10 mm und 0,40 mm dick sind. 20
7. Abschirmungselement nach einem der vorhergehenden Ansprüche, wobei die erste Untergruppe fadenähnliche Elemente umfasst, die einen variablen Anteil zwischen 40 % und 60 % des Gesamtgewichts des Abschirmungselements definieren, wobei die zweite Untergruppe ergänzend fadenähnliche Elemente umfasst, die einen variablen Anteil zwischen 60 % und 40 % des Gesamtgewichts des Abschirmungselements definieren, wobei ein spezifisches Gesamtgewicht pro Einheitsfläche des Abschirmungselements zwischen 400 g/m² und 1600 g/m² beträgt. 25
8. Abschirmungselement nach einem der vorhergehenden Ansprüche, zudem umfassend Begrenzungs- und Stützmittel, assoziiert mit dem Abschirmungselement und ausgestaltet, um einen Umfang davon zu definieren, wobei die Begrenzungs- und Stützmittel vorzugsweise ausgestaltet sind, um dem Abschirmungselement zu erlauben, verschoben und/oder gedreht und/oder aufgerollt zu werden. 30

Revendications

1. Élément de protection destiné à un bâtiment et/ou des travaux civils, l'élément de protection compre-

nant une structure en tissu d'éléments filiformes entrelacés, ladite structure en tissu comprend au moins un premier sous groupe d'éléments filiformes constitués d'un premier matériau comportant un premier groupe de paramètres d'identification mécaniques et/ou optiques, et au moins un second sous groupe d'éléments filiformes constitués d'un second matériau comportant un second groupe de paramètres d'identification mécaniques et/ou optiques, la quantité des paramètres mécaniques et/ou optiques du second sous groupe d'éléments filiformes différant des paramètres mécaniques et/ou optiques correspondants du premier sous groupe ; dans lequel les éléments filiformes appartenant au premier sous groupe comportent des propriétés optiques permettant au moins d'atténuer et/ou d'absorber partiellement les rayons lumineux de l'environnement, les éléments filiformes du premier sous groupe étant opaques optiquement au rayonnement lumineux visible, et dans lequel les éléments filiformes appartenant au second sous groupe comportent des propriétés optiques de réflexion et/ou de diffraction des rayons lumineux de l'environnement, les éléments filiformes du second sous groupe étant optiquement réflecteurs et/ou non absorbants du rayonnement lumineux visible ; **caractérisé en ce que** l'élément de protection peut être installé sur l'extérieur du bâtiment et/ou des travaux civils afin de protéger le bâtiment et/ou les travaux civils des agents extérieurs de l'environnement et/ou de l'altération par les agents atmosphériques, dans lequel les éléments filiformes du premier sous groupe sont constitués d'un matériau polymère ou composite.

2. Élément de protection selon la revendication 1, dans lequel le matériau polymère est du polyester et/ou du polyamide ou le matériau composite est de la fibre de verre, les éléments filiformes du premier sous groupe comportant de préférence un revêtement comprenant du PVC. 35
3. Élément de protection selon l'une quelconque des revendications précédentes, dans lequel les éléments filiformes du second sous groupe sont constitués d'un matériau en métal, le matériau en métal étant de préférence de l'aluminium et/ou un alliage d'aluminium. 40
4. Élément de protection selon l'une quelconque des revendications précédentes, dans lequel les éléments filiformes appartenant au premier sous groupe comportent une section transversale substantiellement circulaire et possèdent un diamètre compris entre 0,30 et 0,60 mm. 45
5. Élément de protection selon l'une quelconque des revendications précédentes, dans lequel les éléments filiformes appartenant au second sous groupe 50

comportent une section transversale substantiellement circulaire et possèdent un diamètre compris entre 0,20 et 0,50 mm.

6. Élément de protection selon l'une quelconque des revendications précédentes, dans lequel les éléments filiformes appartenant au premier et/ou au second sous groupe ont une forme planaire/plate en section transversale et possèdent une épaisseur comprise entre 0,10 et 0,40 mm. 5
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7. Élément de protection selon l'une quelconque des revendications précédentes, dans lequel le premier sous groupe comprend des éléments filiformes définissant un pourcentage variable compris entre 40 et 60 % du poids total de l'élément de protection, le second sous groupe en complémentarité comprenant des éléments filiformes définissant un pourcentage variable compris entre 60 et 40 % du poids total de l'élément de protection, un poids total spécifique par unité de surface de l'élément de protection étant compris entre 400 g/m² et 1 600 g/m². 15
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8. Élément de protection selon l'une quelconque des revendications précédentes, comprenant de plus des moyens de délimitation et de support associés à l'élément de protection et conçus pour définir son périmètre, les moyens de délimitation et de support étant de préférence conçus pour permettre à l'élément de protection d'être translaté et/ou tourné et/ou roulé. 25
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REFERENCES CITED IN THE DESCRIPTION

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