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(54) **Substrate-free surface covering having coupling means**

(57) The present invention relates to a resilient substrate-free surface covering element comprising interlocking means to connect said resilient substrate-free surface covering element to another resilient substrate-free surface covering element.

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Description

Subject of the Invention

[0001] The present invention relates to a resilient substrate-free surface covering element comprising interlocking means and to a surface covering comprising such elements.

Prior art

[0002] Surface coverings are widely used to decorate floors, walls and/or ceilings of buildings or houses and they are generally used in the form of elements, strips or tiles, to be joined together, as there are easier to install.
[0003] Among surface coverings, wooden coverings, ceramic coverings or plastic coverings are well known.
[0004] It is also well known that plastic surface coverings are generally polymer-based coverings, which may be either multiple-layer coverings or substrate-free coverings.
[0005] Multiple layers coverings are heterogeneous coverings and multilayer composites, generally comprising a backing layer, usually called "substrate", and different layers made of distinctive and different composition, commonly, PVC-based or polyolefin-based layers. Generally, the substrate is a non-woven or woven fabric, felt, rubber, compact or foamable resin-based layer.
[0006] Substrate- free surface coverings, also called "homogeneous" coverings are coverings which do not comprise a backing layer or substrate. Such coverings comprise a layer of agglomerated plastic particles. They have a uniform composition across their thickness.
[0007] The installation of surface covering elements of any nature requires a good adhesion to the surface to cover but also between each surface covering elements.
[0008] Traditionally, the surface covering elements are installed using glue down methods. However, the disadvantage of using an adhesive or a glue is that there is only a very limited time to assemble the elements after applying it over the surface to cover. Furthermore, a glue has a limited life time due to aging which results in a decrease of its adhesive strength.
[0009] To get rid of using an adhesive or a glue, it was suggested to use floating assembly methods which allow to mechanically connect, or lock, two adjacent surface covering elements together.
[0010] Floating hardwood, wood laminate or multiple layers polymer floorings are known. However, no solution is provided for substrate-free surface resilient coverings.

Aims of the invention

[0011] The present invention provides a substrate-free surface covering which do not have the drawbacks of the prior art.
[0012] The present invention provides a substrate-free surface covering which is an alternative of the existing substrate-free surface coverings.

Summary of the invention

[0013] The present invention discloses a resilient substrate-free surface covering element comprising interlocking means to connect said resilient substrate-free surface covering element to another resilient substrate-free surface covering element.
[0014] The "substrate-free" surface covering is a surface covering comprising agglomerated particles. Said covering do not comprise a backing layer (or substrate) on which the particles are poured onto, before the agglomeration process.
[0015] According to particular embodiments, the resilient substrate-free surface covering element comprises one or a suitable combination of any of the following characteristics:

- the interlocking means are complementary to, and for cooperation with, the interlocking means of the another resilient substrate-free surface covering element to form an interconnection junction,
- the resilient substrate-free surface covering element comprises first and second interlocking means, said first interlocking means being complementary to, and for cooperation with, said second interlocking means,
- the first interlocking means are provided on at least a first edge of said surface covering element and the second interlocking means on at least a second edge of said surface covering element,
- the interlocking means are provided on all the length of the said surface covering element,
- the interlocking means form a finger joint junction,
- the interlocking means form a tongue and groove engagement,
- the interlocking means form puzzle type of engagement,
- the interlocking means form a hook and loop engagement,

[0016] The present invention further discloses a resilient substrate-free surface covering comprising at least two resilient substrate-free surface covering elements according to the invention.

Detailed description of the invention

[0017] A decorative surface covering, in particular a floor covering, presents specific mechanical properties, particularly in terms of mechanical resistance, wear and indentation resistance, but also in terms of comfort, softness, sound and heat insulation.
[0018] Particularly, the substrate- free surface covering (homogenous surface covering) fulfills the recommendation of the norm ISO 10581 regarding resilient floor coverings, which is incorporated by reference in the

present description.

[0019] The substrate-free surface covering element according to the invention is a resilient element. It fulfills thus the recommendation of the norm ISO 10581.

[0020] The substrate-free surface covering element is a plastic element, preferably a thermoplastic element, even more preferably a polymer-based element.

[0021] The substrate-free surface covering element comprises agglomerated particles, preferably multicolored particles.

[0022] The particles are obtained by cutting or shredding a sheet made from a composition which comprises a plastic material or thermoplastic material, or a polymer-based material, for example rubber material, PVC material or polyolefin material.

[0023] The composition may further comprise a filler a stabilizer, an antioxidant, a matting agent, or a combination thereof. A PVC-based composition may further comprise a plasticizer. The composition may further comprise a pigment or a combination of pigments.

[0024] The composition is processed to obtain a sheet of any suitable length and thickness and having a uniform colour, or a marble effect using different colours. Said sheet is then cut using any suitable cutting means into particles.

[0025] The particles, produced from one sheet, or a plurality of sheets of different colours, have different shapes or sizes. They may be in the form of shreds, crumbs, chips, flakes, pebbles, granules or a mix thereof. They may have any suitable size and thickness.

[0026] The particles are deposited, or scattered, directly on a moving carrier, which is not part of the final surface covering element, preferably a band-shaped moving carrier from for example a double belt press. No bottom layer, or substrate, is used.

[0027] The substrate-free surface covering element according to the present invention may be then embossed using any suitable embossing device.

[0028] Preferably, the top side of the substrate- free surface covering element, with or without embossment, is coated with a varnish layer, preferably a polyurethane-based layer, and more preferably UV- curable polyurethane.

[0029] In another preferred embodiment, the substrate-free surface covering element is obtained from an intermediate product, with or without top coating, with or without embossing, which is cut into elements, tiles or strips.

[0030] The substrate-free surface covering element has any suitable shape. Preferably it has a quadrilateral shape, preferably a square or rectangular shape. However, the surface covering element may also have an hexagonal shape.

[0031] The substrate-free surface covering element comprises interlocking means, being any suitable means to couple, or join, two substrate-free surface covering elements together.

[0032] The interlocking means may be provided on the upper, the lower surface of the substrate-free surface covering element, on one edge, a plurality of edges of the substrate-free surface covering element, or a combination thereof.

[0033] In a preferred embodiment, the interlocking means are provided on one surface or one edge of the substrate-free surface covering element, the interlocking means being complementary to and for cooperation with interlocking means of another the substrate-free surface covering element to joint.

[0034] In another preferred embodiment, the substrate-free surface covering element comprises first interlocking means provided on one surface and second interlocking means provided on another surface, the first interlocking means being complementary to and for cooperation with said second interlocking means to form an interconnection junction.

[0035] Preferably, the first interlocking means are provided on at least a first edge of the substrate- free surface covering element and the second interlocking means on at least a second edge of the substrate- free surface covering element. The first and second edges may be either opposite or adjacent.

[0036] The number of edges comprising the first and/or second interlocking means may depend on the shape of the substrate-free surface covering element.

[0037] The first and/or second interlocking means may be provided on all or part of the length of the surface, surfaces, edge or edges of the substrate-free surface covering element.

[0038] In a preferred embodiment, the first and/or second interlocking means form a finger joint junction engagement.

[0039] Preferably, the first interlocking means comprise an upper portion of the substrate- free surface covering element extending outwardly from at least one edge of the substrate- free surface covering element, and the second interlocking means comprising a lower portion of the substrate- free surface covering element extending outwardly from at least one other edge of the substrate-free surface covering element.

[0040] In the finger joint junction, the first and/or second interlocking means may further comprise fastening means provided either continuously or discontinuously, preferably along the entire length of the edge of the substrate-free surface covering element. The fastening means be any suitable means, adhesives or fasteners, such as for example a glue, a thermal adhesive, a hook and loop fastener such as Velcro® type system or a combination thereof.

[0041] The first and second interlocking means may form a tongue and groove engagement.

[0042] The tongue and groove engagement may have any suitable design.

[0043] In a preferred embodiment, the first and/or second interlocking means are the ones described in US3205633, US5630304, US20040216418, W02006043893, US6715253, W0200177461 or

US2009019808, which are integrated by reference in the present description.

[0044] The first and second interlocking means may form a puzzle type of engagement.

[0045] The projections and cutouts of such puzzle type engagement may have any suitable design.

[0046] In a preferred embodiment, the first and/or second interlocking are the ones described in US5791114 or US2003131549 which are integrated by reference in the present description.

[0047] The first and second interlocking means may form a hook and loop engagement.

[0048] The hooks and loops of such engagement may have any suitable design.

[0049] In a preferred embodiment, the first and/or second interlocking means are the ones described in US5448865 which is integrated by reference in the present description.

[0050] The first and second interlocking means may be produce by any suitable method.

[0051] For example, interlocking means 2 and/or 3 may be produced by cutting, laser or water jet cutting, milling, moulding, planning.

[0052] Generally on an heterogeneous or multiple layer surface covering, the production of the interlocking means reveals the underlying layers of such coverings, thus requiring to mask said layers by an supplementary decorating step. For the substrate-free surface covering element according to the invention the production of the interlocking means reveals no aesthetic differences due to the fact that a substrate-free surface covering element has a uniform composition across their thickness. Therefore, no supplementary decoration is needed.

[0053] Furthermore, the substrate- free surface covering element according to the invention has the advantage of having no curl, or very limited curl, in spite of being resilient.

[0054] The resilient substrate-free surface covering according to the invention comprises at least one substrate-free surface covering element according to the invention.

[0055] The substrate-free surface covering may comprise, for example, a first surface covering element comprising interlocking means are provided on only one surface or one edge to cooperate with the complementary interlocking means of a second surface covering element. The second surface covering element comprise thus complementary interlocking means to cooperate with the ones of the first surface covering element, but may also comprise the same interlocking means than the one of the first surface covering element.

[0056] The substrate-free surface covering may comprise a plurality of surface covering elements comprising first and second interlocking means, said first interlocking means being complementary to and for cooperation with said second interlocking means.

Claims

1. A resilient substrate-free surface covering element comprising interlocking means to connect said resilient substrate-free surface covering element to another resilient substrate-free surface covering element.

2. The resilient substrate-free surface covering element according to claim 1, wherein the interlocking means are complementary to, and for cooperation with, the interlocking means of the another resilient substrate-free surface covering element to form an interconnection junction.

3. The resilient substrate-free surface covering element according to claims 1 or 2, comprising first and second interlocking means, said first interlocking means being complementary to, and for cooperation with, said second interlocking means.

4. The resilient substrate-free surface covering element according to claim 3, wherein the first interlocking means are provided on at least a first edge of said surface covering element and the second interlocking means on at least a second edge of said surface covering element.

5. The resilient substrate-free surface covering element according to any of the preceding claims, wherein the interlocking means are provided on all the length of the said surface covering element.

6. The resilient substrate-free surface covering element according to any of the preceding claims, wherein the interlocking means form a finger joint junction.

7. The resilient substrate-free surface covering element according to claims 1 to 5, wherein the interlocking means form a tongue and groove engagement.

8. The resilient substrate-free surface covering element according to any of the claims 1 to 5, wherein the interlocking means form puzzle type of engagement.

9. The resilient substrate-free surface covering element according to any of the claims 1 to 5, wherein the interlocking means form a hook and loop engagement.

10. A resilient substrate-free surface covering comprising at least two resilient substrate-free surface covering elements according to any of the preceding claims.

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EUROPEAN SEARCH REPORT

Application Number
EP 12 16 1781

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	EP 2 180 116 A2 (NICOCYL GMBH [DE]) 28 April 2010 (2010-04-28) * the whole document *	1-10	INV. E04F15/10
X	EP 2 339 092 A1 (FLOORING IND LTD SARL [LU]) 29 June 2011 (2011-06-29) * figures 1-14 *	1-5,7,10	
A	EP 2 153 967 A1 (TARKETT FRANCE [FR]) 17 February 2010 (2010-02-17) * the whole document *	1	
			TECHNICAL FIELDS SEARCHED (IPC)
			E04F

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	6 August 2012	Fournier, Thomas

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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A : technological background
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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 ON EUROPEAN PATENT APPLICATION NO. EP 12 16 1781

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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06-08-2012

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

REFERENCES CITED IN THE DESCRIPTION

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- US 2009019808 A **[0043]**
- US 5791114 A **[0046]**
- US 2003131549 A **[0046]**
- US 5448865 A **[0049]**