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(54) **Title:** FOLDABLE CARPET AND METHOD FOR PRODUCTION THEREOF

(57) **Abstract:** The present invention relates to a foldable carpet for residential, office and commercial buildings comprising a flat weave fabric, wherein the flat weave fabric comprises warp yarns and weft yarns, wherein the warp yarns and the weft yarns are interwoven, wherein the flat weave fabric comprises a plurality of floats, and wherein the flat weave fabric comprises a visible side and a back, wherein the flat weave fabric comprises two groups of floats, wherein a first group comprises floats with a length of at least one and at most five and wherein a second group comprises floats with a length of at least six and at most twenty. The invention also relates to a method of manufacturing a foldable carpet and a use of a foldable carpet or a method according to the present invention for tailor-made carpets.

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FOLDABLE CARPET AND METHOD FOR PRODUCTION THEREOF

TECHNICAL FIELD

The invention relates to a foldable carpet for residential, office and commercial buildings.

In a second aspect, the invention also relates to a method for manufacturing a foldable carpet.

In a third aspect, the invention also relates to a use for tailor-made carpets.

PRIOR ART

Carpets are traditionally rolled up for transport. A rolled-up carpet is voluminous, heavy and has a very elongated shape. Rolled up carpets are therefore difficult to handle for a parcel service. A parcel deliverer is usually alone, making carrying a carpet a cumbersome and non-ergonomic chore. Due to the elongated shape, a rolled-up carpet is also difficult to arrange among all the other parcels in a delivery van of the parcel service. As a result, online sale of a carpet is practically not feasible, because a specific delivery service must be used that almost only transports carpets.

Another disadvantage of a traditional carpet is that it cannot be easily stored. As a result, after a carpet has been installed in a room, it often remains in place until it is worn out and replaced. It is difficult to replace carpets temporarily or long-term by another carpet to obtain a different decoration of a room.

Another disadvantage of a traditional carpet is that it is difficult to clean. The carpet can be vacuumed or, while lying on a floor surface, cleaned with a detergent. The disadvantage here is that the carpet can only be cleaned on one side and that the carpet is difficult to dry, so that there is a risk of moisture damage to the carpet.

A foldable carpet could solve many of the mentioned drawbacks.

Such a foldable carpet is known from CN202723478U. CN '478 describes a foldable carpet comprising at least two main parts joined together by a folding section. The

folding section is reticulated and allows to fold the carpet in half transversely to the folding section.

This known foldable carpet has the following drawbacks or problems. First of all, the folding section forms a clearly visible line in the carpet. In addition, the folding section is a weak link in the foldable carpet and prone to wear and breakage. The folding section is very flexible, which means that the at least two main parts can shift relative to each other, and no dimensionally stable carpet is obtained. Finally, a foldable carpet according to CN '478 does not guarantee that the carpet is easy to carry. The main parts of the carpet can form a traditional heavy carpet.

EP 3 181 745 describes a carpet with raised zones. The carpet uses chenille yarns as weft yarns to obtain a more foldable carpet. This is a huge limitation for possible folding carpet designs. Chenille yarns are also more prone to stretching and deformation and more prone to shrinkage.

EP 3 196 344 discloses a carpet with natural yarns, resistant to fraying. EP '344 does not mention any particular properties in connection with the foldability of the carpet.

The present invention aims to solve at least some of the above problems or drawbacks.

SUMMARY OF THE INVENTION

In a first aspect, the present invention relates to a foldable carpet according to claim 1.

The great advantage of such a carpet is that the flat weave fabric comprises two groups of floats (floating yarns). Due to their limited length, floats from the first group provide a strong and sturdy fabric. Due to their longer length, floats from the second group provide a flexible and foldable fabric. Because the flat weave fabric comprises floats from the first group and floats from the second group, a foldable carpet is obtained which is both sturdy and dimensionally stable, as well as sufficiently flexible to be foldable.

Preferred embodiments of the device are set out in claims 2 to 12.

A specific preferred form of the invention relates to a device according to claim 11.

According to this preferred form, edges of the foldable carpet are formed by fusing warp yarns and weft yarns together at said edges. Traditionally, edges of a carpet are overlocked. Overlocking is the provision of an edging by means of a yarn. Alternatively, the edges of a carpet are folded over and sewn together. In both cases, a stiff edge is obtained that hinders the folding of the carpet. Because the edges of the foldable carpet are formed by fusing warp yarns and weft yarns together at the said edges, very thin edges are obtained, which are essentially no thicker than the flat weave fabric of the foldable carpet and do not hinder the folding of the carpet. It is also advantageous that by fusing the warp yarns and weft yarns together at the said edges, the foldable carpet is prevented from fraying at the edges.

It is also advantageous that edges of the foldable carpet do not fray when the carpet is washed in a washing machine.

In a second aspect, the present invention relates to a method according to claim 13. This method has the advantage, among others, that by weaving and cutting a flat weave fabric a foldable carpet with a low weight is obtained, which is not susceptible to wear or breakage, and which is dimensionally stable. It is also advantageous that the method does not introduce visible fold lines in the foldable carpet.

Preferred forms of the method are described in dependent claims 14-18.

In a third aspect, the present invention relates to a use according to claim 19. This use results in advantageous tailor-made carpets. The tailor-made carpets can be cut to size from a flat weave fabric on order and finished with a specific print according to a customer's wishes, after which the tailor-made carpets are folded, packed in a box, and delivered to the customer by a parcel service. This makes it practically feasible to offer a tailor-made carpet online and to deliver it at short notice. If a different decoration of a room is desired, temporarily or for a long time, the tailor-made carpet can be put back in the box and stored.

An additional advantage is that the carpet can be folded and washed in a washing machine.

DETAILED DESCRIPTION

Unless otherwise defined, all terms used in the description of the invention, including technical and scientific terms, have the meaning as commonly understood by a person skilled in the art to which the invention pertains. For a better understanding of the description of the invention, the following terms are explained explicitly.

In this document, "a" and "the" refer to both the singular and the plural, unless the context presupposes otherwise. For example, "a segment" means one or more segments.

The terms "comprise", "comprising", "consist of", "consisting of", "provided with", "include", "including", "contain", "containing", are synonyms and are inclusive or open terms that indicate the presence of what follows, and which do not exclude or prevent the presence of other components, characteristics, elements, members, steps, as known from or disclosed in the prior art.

Quoting numerical intervals by endpoints comprises all integers, fractions and/or real numbers between the endpoints, these endpoints included.

In the context of this document, the term "float" (or "floating yarn") refers to a section of a yarn that appears continuously on one side of a fabric. This is, for example, a section of a warp yarn which, looking at said side of the fabric, covers adjacent weft yarns. One such float is a warp float. Alternatively, it is a section of a weft yarn covering adjacent warp yarns. This is a weft float. The term "float length" refers to how many adjacent weft yarns or adjacent warp yarns are continuously covered by a section of a warp yarn or a section of a weft yarn, respectively.

In a first aspect, the invention relates to a foldable carpet for residential, office and commercial buildings.

In a preferred embodiment, the foldable carpet comprises a flat weave fabric. The flat weave fabric comprises warp yarns and weft yarns. The warp yarns are white, ecru, or dyed. The warp yarns and weft yarns are interwoven. Weaving techniques for interweaving warp yarns and weft yarns are known in the art. The warp yarns and weft yarns are preferably machine interwoven. The flat weave fabric has a visible side and a back. The back is the side that is intended to be laid on a floor surface in

a room. The visible side is then the side that is visible to people in the room after the foldable carpet has been placed on the floor surface in the room. The flat weave fabric is one continuous woven fabric. This is advantageous to avoid visible fold lines after the foldable carpet has been unfolded on a floor surface. The flat weave fabric may be a single weave or a double weave. A double weave is a weave in which two or more sets of warp yarns and one or more sets of weft yarns are interconnected to form a two-ply fabric.

The flat weave fabric comprises a plurality of floats. Both the back and the visible side comprise floats. The flat weave fabric may comprise warp floats, weft floats or both. The flat weave fabric comprises two groups of floats.

A first group comprises floats with a length of at least one and at most five. This means that the section of the warp yarn or weft yarn continuously covers at least one and at most five weft yarns, respectively warp yarns. The first group of floats are floats with a limited length. Short floats are advantageous for a strong and firm fabric.

Preferably, the first group comprises floats with a length of at most four, more preferably with a length of at most three.

The second group comprises floats with a length of at least six and at most twenty. The second group of floats are floats with a longer length. Longer floats are advantageous for a flexible and foldable fabric. However, floats longer than twenty are disadvantageous because these floats form loops on the visible side or the back, which can easily be hooked in, causing damage or rapid wear of the flat weave fabric. In addition, long floats can shift, disrupting the visual appearance of the flat weave fabric. This is particularly disadvantageous with floats longer than twelve which cross a fold line when the carpet is folded. By shifting floats with a length longer than twenty, a fold line remains clearly visible after unfolding a foldable carpet on a floor surface. By limiting the length of the floats in the second group to a maximum of twenty, visible fold lines after unfolding are avoided.

Preferably, the second group comprises floats with a length of at least 6, more preferably at least 7.

Preferably, the second group comprises floats having a length of at most sixteen.

Because the flat weave fabric comprises floats from the first group and floats from the second group, a foldable carpet is obtained which is both sturdy and dimensionally stable, as well as sufficiently flexible to be foldable.

An additional advantage of the foldable carpet is that it can be folded for washing in a washing machine. This is not possible with a traditional carpet. Because it is dimensionally stable, the carpet will not be deformed after washing.

The floats of the first group and the second group are distributed over the entire flat weave fabric. This is advantageous in order to obtain a foldable carpet with uniform properties over its entire surface. The flat weave fabric is preferably woven on a Jacquard loom. A Jacquard loom is advantageous for weaving complex weave patterns with floats of different lengths spread over the entire flat weave fabric.

According to a further embodiment, the first group comprises floats with a length of at least one and at most five and the second group comprises floats with a length of at least six and at most twenty.

Preferably, the first group comprises floats with a length of at most four, more preferably with a length of at most three.

Preferably, the second group comprises floats with a length of at least 6, more preferably at least 7.

Preferably, the second group comprises floats having a length of at most sixteen.

According to a preferred embodiment, the first group comprises at least 70% and at most 90% of all weft floats in the flat weave fabric. The weft floats are the weft floats on the back as well as on the visible side of the flat weave fabric. As a result, there are sufficient weft floats with a limited length for a sufficiently strong and sturdy fabric, while the foldable carpet remains foldable.

Preferably, the first group comprises at least 75% of all weft floats in the flat weave fabric, more preferably at least 80%.

Preferably, the first group comprises at most 85% of all weft floats in the flat weave fabric.

According to a preferred embodiment, the second group comprises at least 10% and at most 30% of all weft floats in the flat weave fabric. The weft floats are the weft floats on the back as well as on the visible side of the flat weave fabric. This means that there are sufficient longer weft floats for a flexible and foldable fabric, while the carpet remains strong and sturdy.

Preferably, the second group comprises at least 15% of all weft floats in the flat weave fabric.

Preferably, the second group comprises at most 25% of all weft floats in the flat weave fabric.

This embodiment is particularly advantageous in combination with a previously described embodiment on the number of weft floats in the first group.

According to a preferred embodiment, an acrylic coating is applied to the back of the flat weave fabric. At least 20 g/m² and at most 100 g/m² acrylic coating was applied.

Preferably at least 30 g/m² acrylic coating was applied, more preferably at least 40 g/m² and even more preferably at least 50 g/m².

Preferably at most 90 g/m² acrylic coating was applied, more preferably at most 80 g/m² and even more preferably at most 70 g/m².

An acrylic coating is advantageous for additionally joining warp yarns and weft yarns, thereby increasing dimensional stability of the foldable carpet. By “dimensional stability” is meant that under load during use, such as tensile and shear forces, the carpet does not deform. It is also advantageous that the acrylic coating is an elastic film on the back of the flat weave fabric, whereby the acrylic coating does not hinder the folding of the foldable carpet.

Particularly advantageous about an acrylic coating is that the acrylic coating cannot be washed from the foldable carpet, so that the foldable carpet is washable.

According to a preferred embodiment, the warp yarns have a yarn count of at least 100 dtex and at most 500 dtex.

Preferably, the warp yarns have a yarn count of at least 115 dtex, more preferably at least 130 dtex, even more preferably at least 140 dtex, and even more preferably at least 150 dtex.

Preferably, the warp yarns have a yarn count of at most 485 dtex, more preferably at most 470 dtex, even more preferably at most 455 dtex, and even more preferably at most 440 dtex.

Warp yarns with a yarn count of at least 100 dtex and at most 500 dtex are strong enough to prevent the foldable carpet from being susceptible to wear and breakage, but also very light and flexible, resulting in a light carpet, which is easy to fold, especially in a direction transverse to the warp yarns.

An additional advantage of a light carpet according to the present invention is that the carpet is sufficiently light to be hung up after washing in a washing machine, allowing the foldable carpet to dry quickly on both the back and the visible side after washing and the risk of moisture damage is almost non-existent.

In a preferred embodiment, the flat weave fabric comprises at least 22 and at most 42 warp yarns per centimeter.

Preferably, the flat weave fabric comprises at least 24 warp yarns per cm, more preferably at least 26 warp yarns per cm, even more preferably at least 28 warp yarns per cm, and even more preferably at least 30 warp yarns per cm.

Preferably, the flat weave fabric comprises at most 40 warp yarns per cm, more preferably at most 38 warp yarns per cm, even more preferably at most 36 warp yarns per cm, and even more preferably at most 34 warp yarns per cm.

This embodiment is advantageous in obtaining a flat weave comprising enough warp yarns for strength, wear resistance and dimensional stability, while the foldable carpet remains foldable. This embodiment is particularly advantageous in combination with a previously described embodiment in which warp yarns have a yarn count of at least 100 dtex and at most 500 dtex, thereby keeping the foldable carpet light and flexible.

It is also advantageous that, due to the good dimensional stability, the shape of the foldable carpet is retained after washing.

In a preferred embodiment, the flat weave fabric comprises at least 12 weft yarns and at most 32 weft yarns per centimeter.

Preferably, the flat weave fabric comprises at least 14 weft yarns per cm, more preferably at least 16 weft yarns per cm, even more preferably at least 18 weft yarns per cm, and even more preferably at least 20 weft yarns per cm.

Preferably, the flat weave fabric comprises at most 30 weft yarns per cm, more preferably at most 28 weft yarns per cm, even more preferably at most 26 weft yarns per cm, and even more preferably at most 24 weft yarns per cm.

Weft yarns often comprise yarns with a higher yarn count than warp yarns, such as, for example, but not limited to chenille yarns, filaments, and fantasy yarns. This embodiment is advantageous for obtaining a flat weave fabric which comprises sufficient weft yarns for strength, wear resistance and dimensional stability and which remains foldable when, for example, chenille yarns, filaments and/or fantasy yarns are used. This embodiment is particularly advantageous in combination with a previously described embodiment in which the flat weave fabric comprises at least 22 and at most 42 warp yarns per centimeter to obtain a foldable carpet that is light and flexible.

According to an embodiment, the flat weave fabric has a weight of at least 650 g/m² and at most 1300 g/m².
Preferably, the flat weave fabric has a weight of at least 700 g/m², more preferably at least 725 g/m², and even more preferably at least 750 g/m².

Preferably, the flat weave fabric has a weight of at most 1200 g/m², more preferably at most 1100 g/m² and even more preferably at most 1050 g/m².

This is advantageous because a carpet is sufficiently light to be carried by a parcel deliverer of a parcel service and also has a sufficient weight that a foldable carpet will lie flat on a floor surface.

This is also advantageous to be able to hang up the foldable carpet after washing in a washing machine, so that the foldable carpet can dry quickly on both the back and the visible side after washing and the risk of moisture damage is almost non-existent.

According to a preferred embodiment, the weft yarns comprise a chenille yarn with a yarn count of at least 2000 dtex and at most 7000 dtex.

Preferably, the chenille yarns have a yarn count of at least 2100 dtex, more preferably at least 2200 dtex, even more preferably at least 2300 dtex and even more preferably at least 2400 dtex.

Preferably, the chenille yarns have a yarn count of at most 7000 dtex, more preferably at most 6900 dtex, even more preferably at most 6800 dtex, and even more preferably at most 6700 dtex.

The chenille yarns are white, ecru, or dyed. Chenille yarns are advantageous for providing volume and a soft feel to the foldable carpet.

According to a preferred embodiment, the weft yarns comprise a filament yarn having a yarn count of at least 600 dtex and at most 3000 dtex.

Preferably, the filament yarns have a yarn count of at least 610 dtex, more preferably at least 620 dtex, and even more preferably at least 630 dtex.

Preferably, the filament yarns have a yarn count of at most 2900 dtex, more preferably at most 2800 dtex, even more preferably at most 2700 dtex, and even more preferably at most 2600 dtex.

The filament yarns are white, ecru, or dyed. Filament yarns are advantageous for providing volume and a soft feel to the foldable carpet, while the yarn count of the filament yarns keeps the weight of the foldable carpet low.

A low weight of the foldable carpet is also advantageous to be able to hang up the foldable carpet after washing in a washing machine, so that the foldable carpet can dry quickly on both the back and the visible side after washing and the risk of moisture damage is almost non-existent.

According to a preferred embodiment, the weft yarns comprise a composite yarn having a yarn count of at least 2000 dtex and at most 4000 dtex. The composite yarn is preferably dyed. The composite yarn is composed of different fibers. The different fibers preferably have a different color or shade.

Preferably, the composite yarns have a yarn count of at least 2100 dtex, more preferably at least 2200 dtex, and even more preferably at least 2300 dtex.

Preferably, the composite yarns have a yarn count of at most 3900 dtex, more preferably at most 3800 dtex, even more preferably at most 3700 dtex, and even more preferably at most 3600 dtex.

Composite yarns are advantageous for giving a color accent to the foldable carpet. The composite yarns may be visible primarily on the visible side, primarily on the back, or on the visible side and back of the flat weave fabric.

According to a preferred embodiment, the weft yarns comprise a spun yarn having a yarn count of at least 2000 dtex and at most 4000 dtex. The spun yarn is preferably dyed.

Preferably, the spun yarns have a yarn count of at least 2100 dtex, more preferably at least 2200 dtex, and even more preferably at least 2300 dtex.

Preferably, the spun yarns have a yarn count of at most 3900 dtex, more preferably at most 3800 dtex, even more preferably at most 3700 dtex, and even more preferably at most 3600 dtex.

Spun yarns are advantageous for providing color to the foldable carpet. The spun yarns may be visible primarily on the visible side, primarily on the back, or on the visible side and back of the flat weave fabric. Spun yarns are an alternative to composite yarns.

According to a preferred embodiment, the weft yarns comprise a fantasy yarn having a yarn count of at least 800 dtex and at most 5500 dtex. The fantasy yarn is preferably dyed. The fantasy yarn is composite, twisted and/or twined.

Preferably, the fantasy yarns have a yarn count of at least 850 dtex, more preferably at least 900 dtex, and even more preferably at least 950 dtex.

Preferably, the fantasy yarns have a yarn count of at most 5400 dtex, more preferably at most 5300 dtex, even more preferably at most 5200 dtex, and even more preferably at most 5100 dtex.

Fantasy yarns are advantageous for providing a color accent to the foldable carpet. The fantasy yarns are preferably visible mainly on the visible side of the flat weave fabric.

In a preferred embodiment, the weft yarns comprise a chenille yarn, a filament, and a composite yarn. The chenille yarns, filaments and the composite yarns are as in previously described embodiments. The chenille yarns and the filaments are advantageous for a bulky foldable carpet, while the carpet is light because of the filaments. The composite yarns give a color accent to the foldable carpet.

A foldable carpet according to the present embodiment is additionally advantageous because it is light, allowing it to be hung up after washing in a washing machine, and allowing it to dry quickly on both the back and the visible side, making the chance of moisture damage almost non-existent.

According to a further embodiment, the weft yarns comprise a fantasy yarn as in a previously described embodiment.

According to a further embodiment, the flat weave fabric comprises at least 200 g/m² and at most 300 g/m² chenille yarns, at least 100 g/m² and at most 200 g/m² filament, at least 150 g/m² and at most 250 g/m² composite yarns and at least 50 g/m² and at most 300 g/m² fantasy yarns. The weights are expressed per square meter of the flat weave fabric. This embodiment is advantageous for obtaining a bulky foldable carpet with a light weight and color accents.

A low weight of the foldable carpet is also advantageous to be able to hang up the foldable carpet after washing in a washing machine, so that the foldable carpet can dry quickly on both the back and the visible side after washing and the risk of moisture damage is almost non-existent.

It will be apparent to one skilled in the art that other advantageous combinations of warp yarns and weft yarns in the flat weave fabric are possible, non-limiting examples being a flat weave fabric wherein the weft yarns are only chenille yarns or a flat weave fabric wherein the composite yarns are replaced by spun yarns.

According to a preferred embodiment, the flat weave fabric is printed on the visible side. The printing is done by means of transfer printing, inkjet printing, offset printing, intaglio printing or any other suitable technique. This embodiment is advantageous for tailoring a foldable carpet wherein the flat weave fabric is printed with a design, image or logo desired by a customer.

Preferably, the flat weave fabric in this embodiment comprises white or ecru warp yarns. Preferably, the flat weave fabric in this embodiment comprises white or ecru chenille yarns and/or white or ecru filament yarns as weft yarns. Preferably, composite yarns are visible only on the back of the flat weave fabric. This is advantageous in order to obtain a predominantly white or ecru visible side so that the printing on the visible side of the flat weave fabric is clearly visible. Optionally, the flat weave fabric additionally comprises fantasy yarns as weft yarns. The fantasy yarns give a color accent in the printing on the visible side of the flat weave fabric.

This embodiment can advantageously be combined with a previously described embodiment in which an acrylic coating is applied to the back of the flat weave fabric. Because the acrylic coating is applied to the back, the acrylic coating does not affect the printing of the visible side, while the dimensional stability of the foldable carpet is improved.

According to a preferred embodiment, the edges of the foldable carpet are formed by fusing warp yarns and weft yarns together at said edges. The warp and weft yarns are preferably heat cut with the edges of the foldable carpet being formed during the cutting to size of the flat weave fabric. The flat weave fabric is preferably cut to size using a heated knife, a laser, an ultrasonic cutter, or other suitable tool. Alternatively, said edges are formed after cutting to size, for example by means of a conventional knife, by passing said edges along a heated surface.

This embodiment is advantageous in that very thin edges are obtained as a result, which are basically no thicker than the flat weave fabric of the foldable carpet and do not hinder the folding of the carpet. It is also advantageous that by fusing the

warp yarns and weft yarns together at the said edges, the foldable carpet is prevented from fraying at the edges.

It is also advantageous that edges of the foldable carpet do not fray when the carpet is washed in a washing machine.

In a preferred embodiment, the warp yarns and the weft yarns are 100% polyester. This is advantageous for recycling a foldable carpet because the foldable carpet can be recycled as a whole. It is not necessary to separate the foldable carpet into different materials for recycling.

Polyester warp and weft yarns are also advantageous because these yarns absorb less dirt. In addition, polyester warp yarns and weft yarns shrink to a very limited extent during washing, so that the foldable carpet retains its shape when washed.

According to an embodiment, the foldable carpet consists of a flat weave fabric. The flat weave fabric may be printed and have an acrylic coating applied to the back, as in previously described embodiments. However, the foldable carpet does not comprise additional layers, such as, for example, a rubber layer as an anti-slip layer, or a fleece or fabric for improving the dimensional stability of the foldable carpet. Such additional layers make a carpet firmer and/or stiffer, so that the carpet is less or not foldable.

According to an embodiment, the foldable carpet is foldable into a beam-shaped volume, wherein the beam-shaped volume has a surface area that is at least 2.5 times smaller than a surface area of the foldable carpet and wherein the beam-shaped volume has a height with a value in cm that is at least 200 times smaller than a value for the surface area in cm^2 of the foldable carpet. The foldable carpet remains within the beam-shaped volume only by gravity. This is advantageous for storing the foldable carpet in a box of reduced dimensions or for washing the foldable carpet in a washing machine. For example, a foldable carpet according to the present invention, measuring 295 cm by 400 cm, may be stored in a 40 cm x 60 cm x 20 cm box. The surface area of the foldable carpet is 118,000 cm^2. The surface area of the box is 2,400 cm^2. The surface area of the box is at least 49 times smaller than the surface area of the foldable carpet. The value of the height of the box in cm is 20 and the value of the surface area of the foldable carpet in cm^2 is 118,000. The value

of the height of the box in cm is 5,900 times smaller than the surface area of the foldable carpet in cm^2.

According to an embodiment, the foldable carpet is machine washable. The foldable carpet does not shrink during washing and is dimensionally stable.

In a second aspect, the invention relates to a method of manufacturing a foldable carpet.

In a preferred embodiment, the method comprises the steps of:

- weaving a flat weave fabric;
- cutting the flat weave fabric into a foldable carpet.

The flat weave fabric comprises warp yarns and weft yarns. The warp yarns are white, ecru, or dyed. The warp yarns and weft yarns are interwoven. The flat weave fabric has a visible side and a back. The flat weave fabric is one continuous woven fabric. The flat weave fabric may be a single weave or a double weave.

The flat weave fabric comprises a plurality of floats. Both the back and the visible side comprise floats. The flat weave fabric may comprise warp floats, weft floats or both. The flat weave fabric comprises two groups of floats.

A first group comprises floats with a length of at least one and at most five. This means that the section of the warp yarn or weft yarn continuously covers at least one and at most five weft yarns, respectively warp yarns. The first group of floats are floats with a limited length. Short floats are advantageous for a strong and firm fabric.

Preferably, the first group comprises floats with a length of at most four, more preferably with a length of at most three.

The second group comprises floats with a length of at least six and at most twenty. The second group of floats are floats with a longer length. Longer floats are advantageous for a flexible and foldable fabric.

Preferably, the second group comprises floats with a length of at least 6, more preferably at least 7.

Preferably, the second group comprises floats having a length of at most sixteen.

Because the flat weave fabric comprises floats from the first group and floats from the second group, a foldable carpet is obtained which is both sturdy and dimensionally stable, as well as sufficiently flexible to be foldable.

The floats of the first group and the second group are distributed over the entire flat weave fabric. This is advantageous in order to obtain a foldable carpet with uniform properties over its entire surface. The flat weave fabric is preferably woven on a Jacquard loom. A Jacquard loom is advantageous for weaving complex weave patterns with floats of different lengths spread over the entire flat weave fabric.

This method has the advantage, among others, that by weaving and cutting a flat weave fabric a foldable carpet with a low weight is obtained, which is not susceptible to wear or breakage, and which is dimensionally stable. It is also advantageous that the method does not introduce visible fold lines in the foldable carpet.

Particularly advantageous about the method is that a foldable carpet is obtained, which can be folded for washing in a washing machine. This is not possible with a traditional carpet. Because it is dimensionally stable, the carpet will not be deformed after washing.

According to a further embodiment, the first group comprises floats with a length of at least one and at most five and the second group comprises floats with a length of at least six and at most twenty.

Preferably, the first group comprises floats with a length of at most four, more preferably with a length of at most three.

Preferably, the second group comprises floats with a length of at least 6, more preferably at least 7.

Preferably, the second group comprises floats having a length of at most sixteen.

According to a preferred embodiment, the first group comprises at least 70% and at most 90% of all weft floats in the flat weave fabric. The weft floats are the weft floats

on the back as well as on the visible side of the flat weave fabric. As a result, there are sufficient weft floats with a limited length for a sufficiently strong and sturdy fabric, while the foldable carpet remains foldable.

Preferably, the first group comprises at least 75% of all weft floats in the flat weave fabric, more preferably at least 80%.

Preferably, the first group comprises at most 85% of all weft floats in the flat weave fabric.

According to a preferred embodiment, the second group comprises at least 10% and at most 30% of all weft floats in the flat weave fabric. The weft floats are the weft floats on the back as well as on the visible side of the flat weave fabric. This means that there are sufficient longer weft floats for a flexible and foldable fabric, while the carpet remains strong and sturdy.

Preferably, the second group comprises at least 15% of all weft floats in the flat weave fabric.

Preferably, the second group comprises at most 25% of all weft floats in the flat weave fabric.

This embodiment is particularly advantageous in combination with a previously described embodiment on the number of floats in the first group.

In a preferred embodiment, the method comprises the additional step of applying an acrylic coating to the back of the flat weave fabric before cutting the flat weave fabric. The acrylic coating is preferably applied with the aid of a lick roller. At least 20 g/m² and at most 100 g/m² acrylic coating is applied.

Preferably at least 30 g/m² acrylic coating is applied, more preferably at least 40 g/m² and even more preferably at least 50 g/m².

Preferably at most 90 g/m² acrylic coating is applied, more preferably at most 80 g/m² and even more preferably at most 70 g/m².

An acrylic coating is advantageous for additionally joining warp yarns and weft yarns, thereby increasing dimensional stability of the foldable carpet. It is also

advantageous that the acrylic coating is an elastic film on the back of the flat weave fabric, whereby the acrylic coating does not hinder the folding of the foldable carpet.

Particularly advantageous about an acrylic coating is that the acrylic coating cannot be washed from the foldable carpet, so that the foldable carpet is washable.

In a preferred embodiment, the flat weave fabric is heat cut. The flat weave fabric is cut using a heated knife, a laser, an ultrasonic cutter, or other suitable tool. During cutting, edges are formed on the foldable carpet. The edges are formed by fusing warp yarns and weft yarns together at said edges.

This embodiment is advantageous in that very thin edges are obtained as a result, which are basically no thicker than the flat weave fabric of the foldable carpet and do not hinder the folding of the carpet. It is also advantageous that by fusing the warp yarns and weft yarns together at the said edges, the foldable carpet is prevented from fraying at the edges.

It is also advantageous that edges of the foldable carpet do not fray when the carpet is washed in a washing machine.

According to a preferred embodiment, the method comprises the additional step of printing the visible side of the flat weave fabric. Printing is done by means of transfer printing, inkjet printing, offset printing, intaglio printing or any other suitable technique. This embodiment is advantageous for tailoring a foldable carpet wherein the flat weave fabric is printed with a design, image or logo desired by a customer.

According to a preferred embodiment, the method comprises the additional step of folding the foldable carpet. The foldable carpet is first folded at least twice in a direction parallel to the warp yarns. Preferably, the foldable carpet is folded first from a first edge in a first direction parallel to the warp yarns and then from a second edge, opposite the first edge, in a second opposite direction. This is advantageous because folding lines with an equal folding radius are formed as a result, as a result of which the foldable carpet is easier to fold up. Due to the equal folding radius, there are no visible fold lines after unfolding and smoothing the foldable carpet.

The foldable carpet is then folded at least twice in a direction parallel to the weft yarns. Preferably, the foldable carpet is folded first from a third edge, transverse to

the first and second edges, in a third direction, parallel to the weft yarns, the third edge being laid beyond a fourth edge of the folding carpet, opposite the third edge, forming a first fold line. A distance, measured parallel to the weft yarns, between the first fold line and the fourth edge, is equal to a desired dimension in the direction parallel to the weft yarns after complete folding of the carpet. Thereafter, the foldable carpet is again folded from the third edge in an opposite fourth direction, forming a fold line above the fourth edge. The foldable carpet is always folded in the third and fourth directions, until the desired dimension in the direction parallel to the weft yarns is obtained. This is advantageous because folding lines with an equal folding radius are formed as a result, as a result of which the foldable carpet is easier to fold up. Due to the equal folding radius, there are no visible fold lines after unfolding and smoothing the foldable carpet.

A foldable carpet with warp yarns and weft yarns according to one or more previously described embodiments can be easily folded in a direction parallel to the warp yarns due to the flexible and thin warp yarns. By folding the foldable carpet at least twice in a direction parallel to the warp yarns, the foldable carpet is already partially superimposed in a direction parallel to the warp yarns and additional folds have a larger folding radius. Due to the larger folding radius, it is now also possible to fold in a direction parallel to the weft yarns, so that the foldable carpet can also be superimposed in a direction parallel to the weft yarns. The carpet is now reduced in size both in a direction parallel to the warp yarns and in a direction parallel to the weft yarns and can be packed in a box. Preferably, the folded foldable carpet is wrapped in tissue paper before packaging in the box to protect the foldable carpet during transport. Optionally, a separate carpet underlay is also packed in the box with the foldable carpet.

For packing the foldable carpet in a box, the foldable carpet is preferably folded with the visible side inwards. For washing the foldable carpet in a washing machine, the foldable carpet is preferably folded with the visible side outwards.

It will be apparent to one skilled in the art that depending on the dimensions of the foldable carpet, the carpet will be folded more than twice in the first direction and/or more than twice in the second direction.

According to a further embodiment, the foldable carpet is folded into a beam-shaped volume, wherein the beam-shaped volume has a surface area that is at least 2.5

times smaller than a surface area of the foldable carpet and wherein the beam-shaped volume has a height with a value in cm that is at least 200 times smaller than a value for the surface area in cm^2 of the foldable carpet. The foldable carpet remains within the beam-shaped volume only by gravity. This is advantageous for storing the foldable carpet in a box of reduced dimensions or for washing the foldable carpet in a washing machine.

One skilled in the art will appreciate that a foldable carpet according to the first aspect is preferably manufactured by performing a method according to the second aspect and that a method according to the second aspect is preferably configured to manufacture a foldable carpet according to the first aspect. Each feature described in this document, both above and below, can therefore relate to any of the three aspects of the present invention.

In a third aspect, the invention relates to a use of a foldable carpet according to the first aspect or a method according to the second aspect for tailor-made carpets.

This use results in advantageous tailor-made carpets. The tailor-made carpets can be cut to size from a flat weave fabric on order and finished with a specific print according to a customer's wishes, after which the tailor-made carpets are folded, packed in a box, and delivered to the customer by a parcel service. This makes it practically feasible to offer a tailor-made carpet online and to deliver it at short notice. If a different decoration of a room is desired, temporarily or for a long time, the tailor-made carpet can be put back in the box and stored.

An additional advantage is that the carpet can be folded and washed in a washing machine.

EXAMPLES

The invention will now be further explained on the basis of the following example, without however being limited to this.

EXAMPLE 1

Example 1 concerns a foldable carpet, consisting of a flat weave fabric. The flat weave fabric comprises ecru polyester warp yarn. The warp yarn has a yarn count 167x2 dtex. There are 32 warp yarns per cm of the flat weave fabric.

The foldable carpet has four different weft yarns. A first weft yarn is an ecru chenille yarn made of polyester with yarn count 4545 dtex. A second weft yarn is an ecru fantasy yarn made of polyester with yarn count 4762 dtex. A third weft yarn is an ecru polyester filament with a yarn count of 2100 dtex. A fourth weft yarn is a light gray polyester composite yarn with a yarn count of 3000 dtex. The fourth weft yarn is only visible on the back of the flat weave fabric. The first, second, third and fourth weft yarns are alternately woven into the flat weave fabric. Because the flat weave fabric only comprises ecru yarns on the visible side, this flat weave fabric is particularly suitable for printing.

It is particularly advantageous that the foldable carpet comprises only polyester yarns, whereby it can be easily recycled and whereby the foldable carpet is washable.

The chenille yarn is woven into the flat weave fabric alternately as a one-up-one-down weave: a plain weave, and as a seven-up-one-down weave: an 8-harness satin weave. For a fabric with a width of sixteen warp yarns, this means for a weft as a plain weave, there are eight weft floats of length one on the visible side and eight weft floats of length one on the back. So, this is sixteen weft floats in the first group. For a weft as 8-harness satin weave, this means that there are two weft floats of length seven on the back and two weft floats of length one on the visible side. This means two weft floats in the first group and two weft floats in the second group.

Like the chenille yarn, the fantasy yarn is alternately woven into the flat weave fabric as a plain weave and as an 8-harness satin weave.

The filament yarn is woven into the flat weave fabric as a one-up-seven-down weave: an 8-harness satin weave. For a fabric with a width of sixteen warp yarns, for a weft as 8-harness satin weave, this means that there are two weft floats of length seven on the visible side and two weft floats of length one on the back. This means two weft floats in the first group and two weft floats in the second group.

The composite yarn is woven into the flat weave fabric as a one-up-fifteen-down weave: a 16-harness satin weave. For a fabric with a width of sixteen warp yarns, for a weft as 16-harness satin weave, this means that there is one weft float of length one on the visible side and one weft float of length fifteen on the back. So, this is one weft float in the first group and one weft float in the second group.

For a total of eight wefts, there are two plain weave wefts, four 8-harness satin weave wefts and two 16-harness satin weave wefts. In total there are 42 weft floats in the first group and 10 weft floats in the second group, or 81% of the number of weft floats belong to the first group and 19% of the weft floats belong to the second group.

An acrylic coating has been applied to the back of the flat weave fabric. An acrylic coating of 60 g/m² was applied.

The foldable carpet has a weight of 1010 g/m². The flat weave fabric comprises 125 g/m² warp yarns, 250 g/m² chenille yarns, 265 g/m² fantasy yarns, 125 g/m² filament yarns and 185 g/m² composite yarn.

EXAMPLE 2

This example concerns a similar foldable carpet as the first example. The second weft yarn has been replaced by a silver-colored fantasy yarn made of polyester with a yarn count of 1222 dtex. The flat weave fabric is suitable for printing on the visible side, with the fantasy yarn giving the printing a silver-colored aspect.

The foldable carpet has a weight of 815 g/m². The flat weave fabric comprises 125 g/m² warp yarns, 250 g/m² chenille yarns, 70 g/m² fantasy yarns, 125 g/m² filament yarns and 185 g/m² composite yarn.

EXAMPLE 3

Example 3 relates to a similar carpet as in example 1. The warp yarns are dyed black. The weft yarns do not comprise fantasy yarn. The composite yarns are visible on the visible side. Such a flat weave fabric is suitable if no printing is desired. The warp yarns and the composite yarns give a visual aspect to the visible side of the foldable carpet.

The weft yarns, except for the absence of the fantasy yarns, are woven into the flat weave fabric in a similar manner.

For a total of six wefts, there is one plain weave weft, three 8-harness satin weave wefts and two 16-harness satin weave wefts. In total there are 24 weft floats in the

first group and 8 weft floats in the second group, or 75% of the number of weft floats belong to the first group and 25% of the weft floats belong to the second group.

The foldable carpet has a weight of 745 g/m². The flat weave fabric comprises 125 g/m² warp yarns, 250 g/m² chenille yarns, 125 g/m² filament yarns and 185 g/m² composite yarns.

EXAMPLE 4

Example 4 concerns a foldable carpet according to example 1. The foldable carpet has a length in a direction parallel to the weft yarns of 200 cm and a width in a direction parallel to the warp yarns of 140 cm.

The foldable carpet is folded for shipment to a customer. A first part of the foldable carpet is folded in half from a first edge in a first direction parallel to the warp yarns up to the center of the foldable carpet. A second part of the foldable carpet is folded in half from a second edge, opposite the first edge, in a second opposite direction parallel to the warp yarns up to the center of the foldable carpet. The carpet has been reduced in width from 140 cm to approximately 70 cm. The foldable carpet is folded a third time in a direction parallel to the warp yarns, the first part and the second part being superimposed. The carpet is now about 35 cm wide. By folding the foldable carpet from the first and the second edge towards the center, fold lines of equal fold radius are formed, which makes it easier to fold the foldable carpet. Due to the equal folding radius, there are no visible fold lines after unfolding and smoothing.

After this, the foldable carpet is folded in a third direction, parallel to the weft yarns. The foldable carpet is folded a first time from a third edge, transverse to the first and second edge, 120 cm past a fourth edge, opposite the third edge. A first fold line has been formed. The length of the foldable carpet has been reduced to approximately 160 cm. The foldable carpet is folded a second time, from the same third edge and in an opposite fourth direction, until a second fold line is formed above the fourth edge. The length of the foldable carpet has been reduced to approximately 120 cm. Thereafter, the foldable carpet is again folded in the third direction and the fourth direction, forming a third fold line above the first fold line and a fourth fold line above the second fold line, and wherein the third edge is positioned above the first fold line and third fold line. The length of the foldable carpet has been reduced to approximately 40 cm. As a result of this manner of folding, fold lines with the

same folding radius are always formed, so that the foldable carpet can be folded better. Due to the equal folding radius, there are no visible fold lines after unfolding and smoothing.

The foldable carpet is wrapped in tissue paper and packed together with a folded carpet underlay in a 400mm x 400mm x 200mm box.

CLAIMS

1. A foldable carpet for residential, office and commercial buildings comprising a flat weave fabric, wherein the flat weave fabric comprises warp yarns and weft yarns, wherein the warp yarns and the weft yarns are interwoven, wherein the flat weave fabric comprises a plurality of floats, and wherein the flat weave fabric comprises a visible side and a back, **characterized in that** the flat weave fabric comprises two groups of floats, wherein a first group comprises floats with a length of at least one and at most five and wherein a second group comprises floats with a length of at least six and at most twenty.

2. The foldable carpet according to claim 1, **characterized in that** the first group comprises at least 70% and at most 90% of all weft floats in the flat weave fabric, the weft floats being both the weft floats on the back and on the visible side of the flat weave fabric.

3. The foldable carpet according to claim 1 or 2, **characterized in that** the second group comprises at least 10% and at most 30% of all weft floats in the flat weave fabric, the weft floats being both the weft floats on the back and on the visible side of the flat weave fabric.

4. The foldable carpet according to any of the preceding claims 1-3, **characterized in that** an acrylic coating is applied to the back of the flat weave fabric.

5. The foldable carpet according to any of the preceding claims 1-4, **characterized in that** the warp yarns have a yarn count of at least 100 dtex and at most 500 dtex.

6. The foldable carpet according to any of the preceding claims 1-5, **characterized in that** the flat weave fabric comprises at least 22 and at most 42 warp yarns per centimeter and comprises at least 12 and at most 32 weft yarns per centimeter.

7. The foldable carpet according to any of the preceding claims 1-6, **characterized in that** the flat weave fabric is printed on the visible side.

8. The foldable carpet according to any of the preceding claims 1-7, **characterized in that** the flat weave fabric has a weight of at least 650 g/m² and at most 1300 g/m².

9. The foldable carpet according to any of the preceding claims 1-8, **characterized in that** the weft yarns comprise a chenille yarn with a yarn count of at least 2000 dtex and at most 7000 dtex, a filament yarn with a yarn count of at least 600 dtex and at most 3000 dtex and a composite yarn of at least 2000 dtex and at most 4000 dtex.

10. The foldable carpet according to claim 9, **characterized in that** the weft yarns comprise a fantasy yarn with a yarn count of at least 800 dtex and at most 5500 dtex.

11. The foldable carpet according to any of the preceding claims 1-10, **characterized in that** edges of the foldable carpet are formed by fusing warp yarns and weft yarns together at said edges.

12. The foldable carpet according to any of the preceding claims 1-11, **characterized in that** the foldable carpet is foldable into a beam-shaped volume, the beam-shaped volume having a surface area at least 2.5 times smaller than a surface area of the foldable carpet, the beam-shaped volume having a height with a value in cm that is at least 200 times smaller than a value for the surface area in cm² of the foldable carpet and wherein the foldable carpet remains within the beam-shaped volume only by gravity.

13. A method for manufacturing a foldable carpet comprising:
- weaving a flat weave fabric, wherein the flat weave fabric comprises warp yarns and weft yarns, wherein the warp yarns and the weft yarns are interwoven and wherein the flat weave fabric comprises a visible side and a back;
- cutting the flat weave fabric into a foldable carpet;

characterized in that the flat weave fabric comprises two groups of floats, wherein a first group comprises floats with a length of at least one and at most five and wherein a second group comprises floats with a length of at least six and at most twenty.

14. The method according to claim 13, **characterized in that** the method comprises the additional step of applying an acrylic coating to the back of the flat weave fabric before cutting the flat weave fabric.

15. The method according to claim 13 or 14, **characterized in that** the flat weave fabric is heat cut, edges being formed on the foldable carpet by fusing warp yarns and weft yarns together at said edges.

16. The method according to claim 13, 14 or 15, **characterized in that** the method comprises the additional step of printing the visible side of the flat weave fabric.

17. The method according to any of claims 13-16, **characterized in that** the method comprises the additional step of folding the foldable carpet, wherein the foldable carpet is first folded at least twice in a direction parallel to the warp yarns and then folded at least twice in a direction parallel to the weft yarns.

18. The method according to any of claims 13-17, **characterized in that** the foldable carpet is folded into a beam-shaped volume, the beam-shaped volume having a surface area at least 2.5 times smaller than an area of the foldable carpet, the beam-shaped volume having a height with a value in cm that is at least 200 times smaller than a value for the surface area in cm^2 of the foldable carpet, and wherein the foldable carpet remains within the beam-shaped volume only by gravity.

19. Use of a foldable carpet according to any of claims 1-12 or a method according to any of claims 13-18 for tailor-made carpets.

INTERNATIONAL SEARCH REPORT

International application No
PCT/IB2022/051460

A. CLASSIFICATION OF SUBJECT MATTER
INV. D03D13/00 A47G27/02
ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
D03D A47G

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 3 181 745 A1 (DE POORTERE DECO SA [BE]) 21 June 2017 (2017-06-21) paragraphs [0006], [0015], [0017], [0027] - [0035], [0054]; figure 1 -----	1-19
X	EP 3 196 344 B1 (DE POORTERE DECO SA [BE]) 5 February 2020 (2020-02-05) paragraphs [0003], [0021] - [0024], [0033] - [0040]; figure 1 -----	1-11, 13-17,19

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents :

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Date of the actual completion of the international search	Date of mailing of the international search report
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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/IB2022/051460

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 3181745 A1	21-06-2017	BE 1023321 B1	06-02-2017
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