



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
10.06.2015 Bulletin 2015/24

(51) Int Cl.:
D03D 13/00 (2006.01) **D03D 15/00 (2006.01)**
D03D 15/08 (2006.01) **D03D 3/00 (2006.01)**

(21) Application number: **14196465.0**

(22) Date of filing: **05.12.2014**

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME

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(30) Priority: **09.12.2013 IT MI20132046**

(54) **Fabric comprising a plurality of ribs of the gros grain type**

(57) A fabric (1) is described comprising at least one weft (5) and one warp (6) made of weft filaments (5a) and warp filaments (6a), respectively, the warp filaments (6a) being thinner and denser than the weft filaments (5a)

so as to obtain a fabric (1) comprising a plurality of ribs (2) of the *gros grain* type, the warp (6) being composed of elastic warp filaments (6a) made of an elastic yarn.

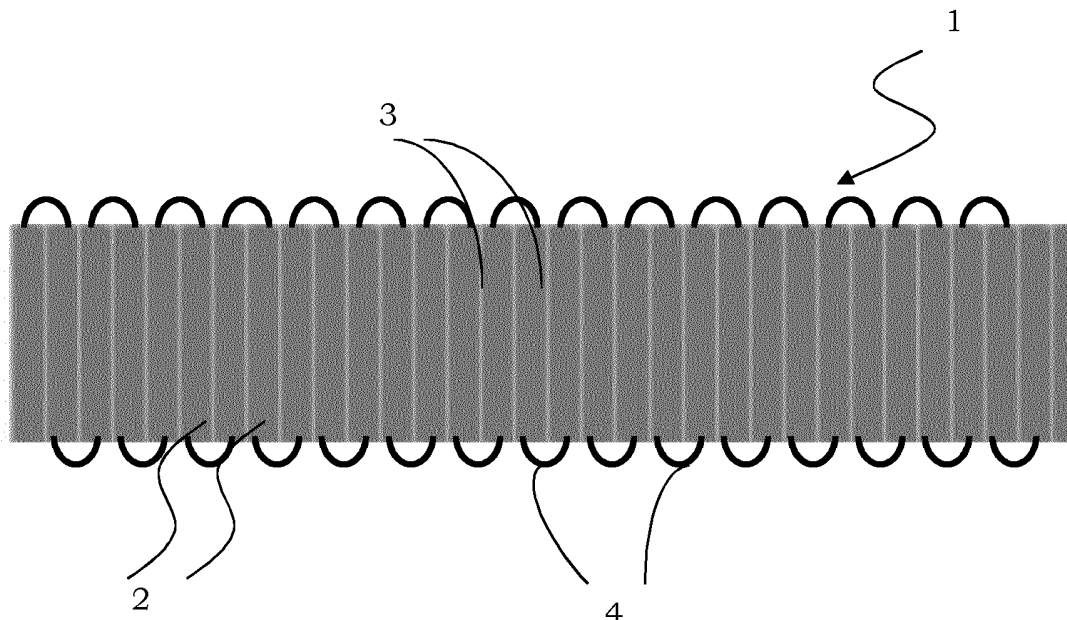


FIG. 1

Description

Application field

[0001] The present invention relates to a fabric provided with ribs of the *gros grain* type, particularly though not exclusively adapted to be used in the textile, clothing, shoes and leather goods sectors.

Prior Art

[0002] As it is well known in the field of dressmaking and industrial making of clothes and clothing, as well as in the production of shoes and leather goods, the so-called "gros grain" fabrics, a French term literally meaning "coarse grain", are widely used.

[0003] The *gros grain* is a warp-dominant fabric, also named cannetté or cannellé, i.e. with ribs, name that recalls the final appearance of this fabric, which is configured as a plurality of fabric ribs tightly placed side by side to each other. This fabric is particularly characterized in having a much denser warp than the weft, the latter being made of filaments of a greater diameter than the warp filaments, or being made of clustered multiple-thread filaments, with respect to single warp filaments, produces well marked transversal stripes, which are called ribs.

[0004] Moreover, a characteristic of the *gros grain* fabric is that the weft filament is only visible at the edge of the selvedge, where it turns to start the next row. Therefore, the result is a fabric where the warp completely covers the weft and that is marked by thin protruding lines, particularly perpendicular to the warp direction, compact and stiff in one way, having a glossy and fine appearance, identical on the face and reverse sides.

[0005] The warp filaments are usually made of silk, rayon or other synthetic fibres, so as to give the fabric a glossy appearance, while the weft is usually made of cotton, using filaments with a greater diameter than the warp.

[0006] A *gros grain* fabric produced in bolt is generally suitable for women clothing and is used for dresses, skirts, jackets; such fabric can be also produced in tape of different heights and used for finishing, as a backing and embellishment in dressmaking or in the fabrication of shoes, bags, and even hats.

[0007] Indeed, it is well known that *gros grain* fabrics generate extremely satisfying results especially in the making of edges and straight connections, particularly in the form of tapes.

[0008] Nevertheless, the difficulties in obtaining equally satisfying results when *gros grain* tapes are applied to more curvy paths and especially when such paths are changed during use are also known. An example well known to those skilled in the art is the case of a *gros grain* tape applied as a finishing edge of a shoe, such as a so-called slipper shoe, following a path which must follow the shoe instep and keep its shape while walking, thus in the presence of deformations of such application path.

[0009] In this case however, the stiffness of the *gros grain* fabrics, which is a highly preferred characteristic for many wires, prevents them from adapting to the changes in the application paths, thereby creating unwanted wrinkles and pleats.

[0010] The technical problem of the present invention is providing a fabric provided with ribs such as to have a *gros grain* type appearance, having such structural and functional characteristics to be used on non-straight paths and with configurations changing during the use, thereby overcoming the limitations and the drawbacks that still affect the fabrics made according to the prior art.

Summary of the invention

[0011] The solution idea underlying the present invention is making a fabric provided with ribs of the *gros grain* type which has a good capacity of adapting to non-straight application paths due to the use of elastic warp filaments.

[0012] According to this solution idea, the technical problem is solved by a fabric comprising at least one weft and one warp made of weft filaments and warp filaments, respectively, said warp filaments being thinner and denser than said weft filaments so as to obtain a fabric comprising a plurality of ribs of the *gros grain* type, characterized in that said warp is composed of elastic warp filaments made of an elastic yarn.

[0013] More particularly, the invention comprises the following additional and optional characteristics, taken either individually or in combination when needed.

[0014] According to one aspect of the invention, the elastic yarn which realises the elastic warp filaments can be chosen among the elastomers with a high thinness and a low elastic power, particularly a count between 30 and 240 dTex, preferably 58 dTex and an elasticity between 1 and 4 cNw, preferably 1,8 cNw when 50% elongation.

[0015] Moreover, the elastic warp filaments can comprise an elastic threadlike core having a count between 20 and 160 dTex, preferably 40 dTex, covered with an elastic covering wire having a count between 20 and 160 dTex, preferably 40 dTex. Particularly, the elastic covering thread is spirally wound, according to a right- or left-handed winding, stapled or interlace around the elastic threadlike core.

[0016] According to another aspect of the invention, the elastic threadlike core can be made of elastomer and the elastic covering wire can be selected from nylon, viscose or glossy polyester.

[0017] According to yet another aspect of the invention, the weft filaments can be made of a yarn having a very high degree of twist, particularly between 40 and 350 TPM (i.e. twists per meter, S or Z twists).

[0018] Particularly, the weft filaments can be made of a yarn of cotton or viscose, preferably gassed cotton, or viscose, or also of a so-called vergolino yarn, namely a cotton yarn composed of several cotton wires, cotton-

waste or other elastomeric synthetic fibre such as polyester or polyurethane or other material, covered by viscose or cotton, particularly spirally wound, or according to a right- or left-handed winding, or twisted parallel or interlaced polyamide having a count of 940 dTex at 1, 2, 3 or 4 threads being twisted together.

[0019] Moreover, according to another aspect of the invention, the weft filaments can have a count between 12 Ne (English number) for 8 threads and 12 Ne for 16 threads with a twist between 295 and 480 TPM, as traditionally stated for the cotton. When vergolino is used, the weft filaments can have a count equal to, for example, a nm (metric number) 10/5, 10/3, 10/2 of cotton core covered by viscose having a count of 300 dTex or by cotton having a count of 20 Ne for 1 thread. When a parallel polyamide is used, the covering filaments of the vergolino can have a count between 156 and 300 dTex.

[0020] According to another aspect of the invention, the ribs can be surrounded by arches made of portions of the weft filaments in correspondence of at least one fabric edge.

[0021] Finally, according to yet another aspect of the invention, the fabric is in the form of a tape having a length and a height chosen according to the specific applications, such a tape being provided with the plurality of ribs placed side by side and parallel to each other along a direction being orthogonal to the one defined by the length of the tape itself.

[0022] In addition, the problem is also solved by a process of weaving a fabric comprising at least one weft and a warp made by weft filaments and warp filaments, respectively, the warp filaments being thinner and denser than the weft filaments and being wound on a warp beam positioned on a support of an unwinding machine of a frame, the process comprising the steps of:

- unwinding the warp filaments from the warp beam, and
- weaving the weft filaments in an alternating manner within the warp filaments in the frame,

characterized in that the step of unwinding the warp filaments 6a comprises unrolling said filaments from the warp beam being loaded with elastic warp filaments 6a and using an electronic control of the unwinding tension.

[0023] The characteristics and advantages of the fabric and of the weaving process according to the invention will become evident from the description made herein below of an exemplary embodiment thereof which is given as a non-limitative indication with reference to the attached drawings.

Brief description of the drawings

[0024] In these drawings:

Fig. 1 schematically shows in a front view a fabric

made according to the present invention;

Fig. 2 schematically shows in a longitudinal section view the fabric of Fig. 1;

Fig. 3 schematically shows in a longitudinal section view a different embodiment of the fabric of Fig. 1;

Fig. 4A schematically shows in a cross section view the fabric of Fig. 1;

Fig. 4B schematically shows in a cross section view the fabric of Fig. 1 in a different operating condition;

Fig. 5 schematically shows in a perspective view the fabric of Fig. 1.

Detailed description

[0025] With reference to these figures, a fabric according to the present invention is generally and schematically designated with 1, particularly in the form of a tape in the illustrated examples by way of illustration only.

[0026] The fabric or tape 1 comprises a plurality of ribs 2, placed side by side along transversal rows shown in 3, each rib 2 being surrounded by an arch 4, in a *gros grain* type configuration.

[0027] Particularly, as schematically shown in Fig. 2, the fabric 1 comprises a weft 5 and a warp 6 made of weft filaments 5a and warp filaments 6a, respectively, which are weaved to each other in a manner known per se according to the *gros grain* configuration, such as to make the plurality of ribs 2 placed side by side along the transversal rows 3, particularly perpendicularly to the direction of the warp 6.

[0028] According to a first aspect of the invention, the warp 6 of the fabric 1 is composed of warp filaments 6a made of an elastic yarn.

[0029] Particularly, such an elastic yarn is chosen among the elastomers so as to have high thinness and low elastic power, particularly a count between 30 and 240 dTex (i.e., decitex, mass in grams of a thread 10.000 m long), preferably 58 dTex and an elasticity between 1 and 4 cNw, preferably 1,8 cNw at 50% elongation.

[0030] According to an aspect of the invention, the warp filaments 6a are made of an elastic yarn having an elastic threadlike core, for example in elastomer, having a count between 20 and 160 dTex, preferably 40 dTex, suitably covered by an also elastic covering wire, for example in glossy nylon, having a count of between 20 and 160 dTex, preferably 40 dTex. As an alternative, wires in viscose or glossy polyester can be used as a cover. The cover wires are conveniently spirally wound, according to a right- or left-handed winding, stapled or interlaced around the threadlike core of the elastic yarn.

[0031] On the other hand, the weft filaments 5a are made of yarns having a very high degree of twist, particularly between 40 and 350 TMP (i.e., twists per meter, S

or Z twists). According to one aspect of the invention, the weft filaments 5a are made of a cotton yarn, particularly gassed cotton, or viscose, or also a so-called vergolino yarn, namely a cotton yarn composed of several cotton wires, cotton-waste or other elastomeric synthetic fibre such as polyester or polyurethane or other material, covered by viscose or cotton, particularly spirally wound or according to a right- or left-handed winding, or parallel polyamide twisted or interlaced having a count of 940 dTex for 1, 2, 3 or 4 threads twisted together.

[0032] In the case of cotton, for example, the weft filaments 5a can have a count between 12 Ne (English number) for 8 threads and 12 Ne for 16 threads having a twist between 295 and 480 TPM. Similarly, in the case of a vergolino use, the weft filaments can have a count equal to, for example, a nm (metric number) 10/5, 10/3, 10/2 of cotton core covered by viscose having a count of 300 dTex or by cotton having a count of 20 Ne for 1 thread. In the case of a parallel polyamide use, the covering filaments of the vergolino can have a count between 156 and 300 dTex.

[0033] It should be noted that, advantageously according to the invention, the warp 6 of the fabric 1 is thus made of elastic warp filaments 6a only, which can give the fabric 1 the desired flexibility and allows it to be used on non-straight paths and with changing configurations during the use, while retaining the rib-like appearance typical of the *gros grain* type fabric.

[0034] More particularly, as shown in the example of Fig. 2, the fabric 1 can be realized with the so-called shuttle technique (shuttle frame) according to which the weft filaments 5a proceed continuously by entering the warp filaments 6a from an edge to the other of the fabric 1 without being tied to the ends.

[0035] It is also possible to realize the fabric 1 with the so-called insertion or weft needle technique (needle frame), as shown in the example of Fig. 3. In such a case, the weft filaments 5a are fixed to one edge 9 of the fabric 1, also shown in the figure by the axis AA, particularly at least one position of change of direction CD, through a thin auxiliary or support thread 7 and to a hook 8 which creates chain stitches along the edge 9 of the fabric 1, in a manner known per se.

[0036] With both techniques, the fabric 1 results to be provided with arches 4 and made of portions of the weft filaments 5a at the edge 9 for each rib 2. The use of weft filaments 5a made of yarns having a very high degree of twist, particularly gassed cotton or viscose, allows countering the natural tendency of the weft to arrange itself along the edges of the fabric 1 and thus allows underlining such arches 4 surrounding the ribs 2.

[0037] Thereby, a *gros grain* fabric is obtained having elastic properties, as schematically depicted in Figs. 4A and 4B.

[0038] Preferably, the fabric 1 is in the form of a tape having a length and a height which are chosen according to the specific applications, the tape being provided with a plurality of ribs 2 placed side by side and parallel to

each other along a direction perpendicular to the one defined by the length of the tape itself.

[0039] It should be noticed that the fabric 1 is made by means of a weaving process on a needle or shuttle frame.

5 Before the weaving process, the warp filaments 6a are made by covering the elastic threadlike core, for example of elastomer, with the covering thread, for example in nylon, by means of suitable reels obtaining elastic warp filaments 6a. Moreover, such elastic warp filaments 6a are wound around a plurality of reels and are unwound by a suitable equipment called warping machine such as to be placed on a flanged holder called warp beam.

[0040] The warp beam is then placed in the frame and particularly at a holder of an unwinding machine.

10 [0041] In accordance with an aspect of the invention, the weaving process thus comprises the steps of:

- unwinding the warp filaments 6a from the warp beam, and
- 20 - weaving the weft filaments 5a in an alternating manner within the warp filaments in the frame,

25 the warp filaments 6a being thinner and denser than the weft filaments 5a such as to obtain a fabric 1 provided with ribs 2 of the *gros grain* type.

[0042] Conveniently, in the weaving process according to the invention, the step of unwinding the warp filaments 6a comprises unwarping such filaments from the warp beam loaded with the elastic warp filaments 6a by means of electronic control of the unwinding tension. The unwound elastic warp filaments 6a are thus woven to obtain a fabric 1 with the desired ribs-like effect 2 and surrounded by arches 4, as schematically depicted in Fig. 5. Again, it should be noted that such a fabric 1 is an elastic fabric, particularly having very high elasticity consistency thanks to the warp 6 elasticity as well as a high uniformity thanks to the weaving process having an unwinding of the elastic warp filaments 6a with electronic control of the unwinding tension.

30 [0043] Thereby, the fabric 1 is obtained, which comprises a plurality of ribs 2, placed side by side along the transversal rows 3, each rib 2 being made of warp filaments 6a consisting of elastic filaments, particularly of elastomer, conveniently sized in such a way as to be thinner and denser than the corresponding weft filaments 5a, which are in turn made of a yarn having a very high degree of twist, such as gassed cotton or viscose, each rib 2 being therefore surrounded by an arch 4 made of a portion of a weft filament 5a.

35 [0044] The main advantage of the fabric according to the invention lies in the high versatility of use thereof, which is mainly due to the fabric having exceptional elastic characteristics in the case of a warp entirely made of elastic filaments.

40 [0045] Particularly, the fabric according to the invention can be thus used on non-linear application paths and having shape changes during the normal use. In this

case, a perfect adherence of the fabric 1 according to the invention to such paths and to their following changes is obtained, without creating unsightly folds.

[0046] Furthermore, the appearance of the fabric according to the invention is perfectly congruent with a *gros grain* fabric having ribs perfectly outlined as well as having separate arches at the edge, as in the case of a fabric made of non-elastic yarns.

[0047] Finally, the fabric obtained according to the invention is an elastic *gros grain* which aesthetically corresponds to a stiff *gros grain* but having a greater application versatility.

[0048] Clearly, those skilled in the art, aiming to meet particular and specific requirements, can make many modifications and variations to the above described fabric, which are all included in the scope of protection of the invention as defined in the following claims.

Claims

1. Fabric (1) comprising at least one weft (5) and a warp (6) made by weft filaments (5a) and of warp filaments (6a), respectively, said warp filaments (6a) being thinner and denser than said weft filaments (5a) so as to obtain a fabric (1) comprising a plurality of ribs (2) of the *gros grain* type, **characterized in that** said warp (6) is composed of elastic warp filaments made of an elastic yarn.
2. Fabric (1) according to claim 1, **characterized in that** said elastic yarn that realizes said elastic warp filaments is chosen among the elastomers with a high thinness and a low elastic power, in particular a count between 30 and 240 dTex, preferably 58 dTex and an elasticity between 1 and 4 cNw, preferably 1.8 cNw when 50% elongated.
3. Fabric (1) according to claim 2, **characterized in that** said elastic warp filaments comprise an elastic threadlike core having a count between 20 and 160 dTex, preferably 40 dTex, covered with an elastic covering wire having a count between 20 and 160 dTex, preferably 40 dTex.
4. Fabric (1) according to claim 3, **characterized in that** said elastic covering wire is spirally wound, according to a right- or left-handed winding, stapled or interlace around said elastic threadlike core.
5. Fabric (1) according to claim 3, **characterized in that** said elastic threadlike core is made of elastomer and said elastic covering wire is selected from nylon, viscose or glossy polyester.
6. Fabric (1) according to any one of the preceding claims, **characterized in that** said weft filaments (5a) are made using a yarn having a high degree of

twist, in particular between 40 and 350 TPM.

7. Fabric (1) according to claim 6, **characterized in that** said weft filaments (5a) are made of means of a yarn of cotton or viscose, preferably gassed cotton or viscose or vergolino or twisted parallel or interlaced polyamide having a count of 940 dTex for 1, 2, 3 or 4 threads being twisted together.
8. Fabric (1) according to claim 6, **characterized in that** said weft filaments (5a) have a count between 12 Ne (English Number) for 8 threads and 12 Ne for 16 threads with a twist between 295 and 480 TPM, for the cotton, or nm (metric number) 10/5, 10/3, 10/2 of cotton core covered by viscose having a count of 300 dTex or by cotton having a count of 20 Ne for 1 thread, in the case of vergolino, or having a count between 156 and 300 dTex in the case of parallel polyamide.
9. Fabric (1) according to any one of the preceding claims **characterized in that** said ribs (2) are surrounded by arches (4) made by portions of said weft filaments (5a) in correspondence of at least one edge (9) of said fabric (1).
10. Fabric (1) according to any one of the preceding claims **characterized in that** said fabric (1) is in the form of a tape having a length and a height chosen according to specific applications, said tape being provided with said plurality of ribs (2) side by side and parallel to each other along a direction being orthogonal to the one defined by the length of the tape itself.
11. Process of weaving a fabric (1) comprising at least one weft (5) and a warp (6) made by weft filaments (5a) and warp filaments (6a), respectively, said warp filaments (6a) being thinner and denser than said weft filaments (5a) and being wound on a warp beam positioned on a support of an unwinding machine of a frame, said process comprising the steps of :
 - unwinding said warp filaments (6a) from said warp beam, and
 - weaving said weft filaments (5a) in an alternating manner within said warp filaments (6a) in said frame,**characterized in that** said step of unwinding said warp filaments (6a) comprises unrolling said filaments from the warp beam being loaded with elastic warp filaments and using an electronic control of the unwinding tension.

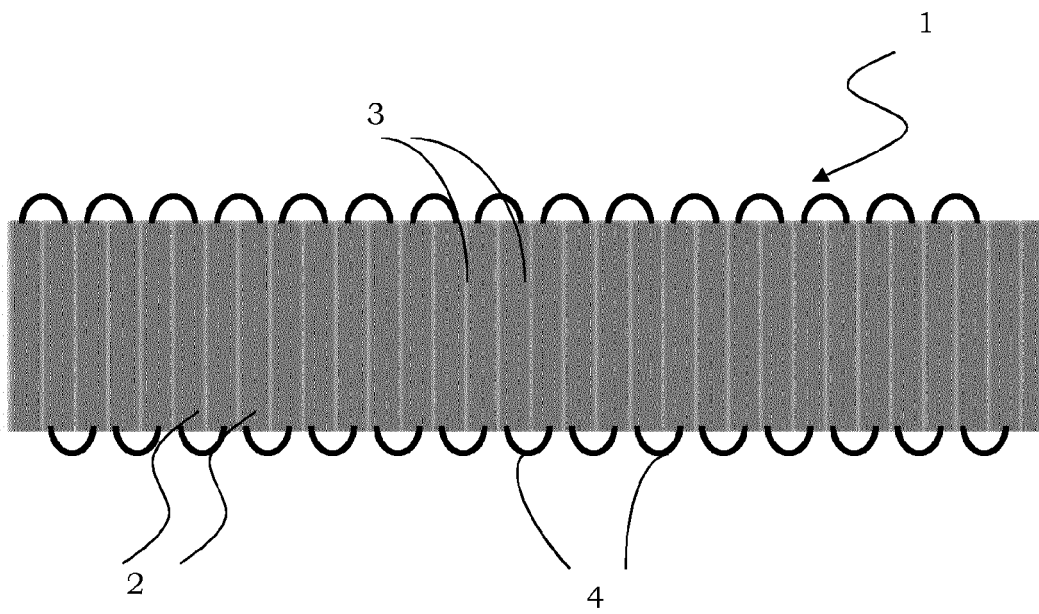


FIG. 1

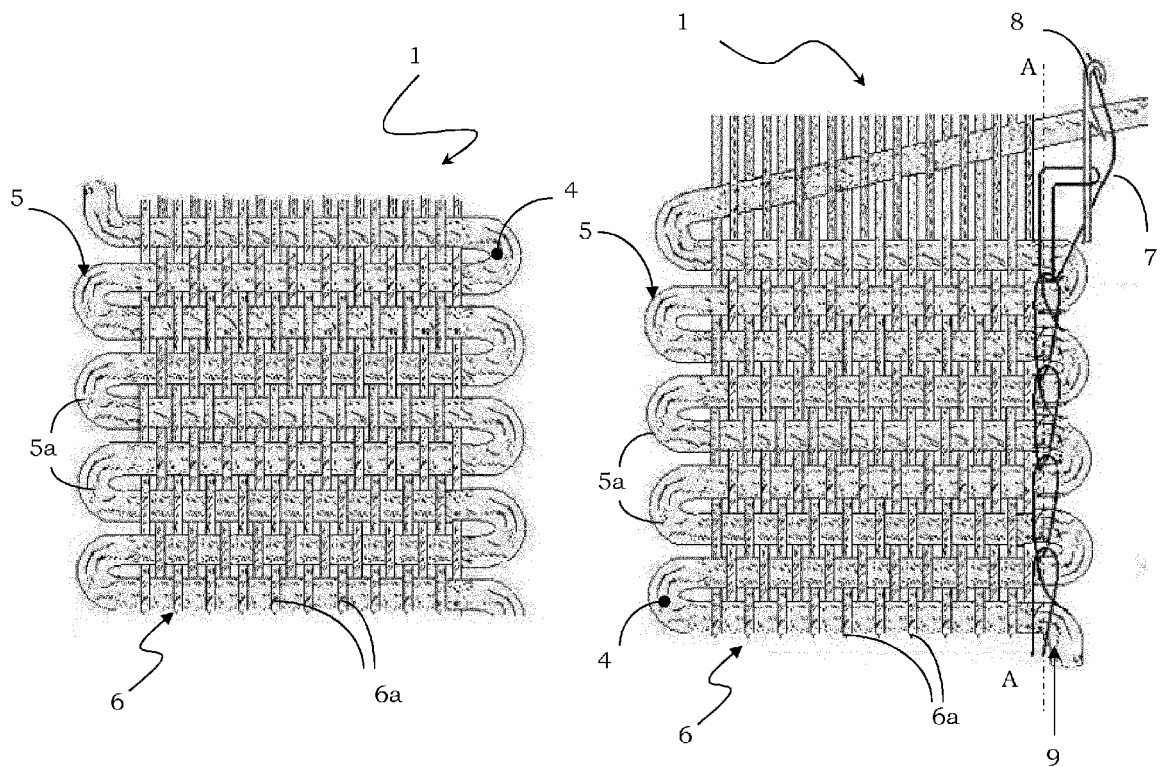


FIG. 2

FIG. 3

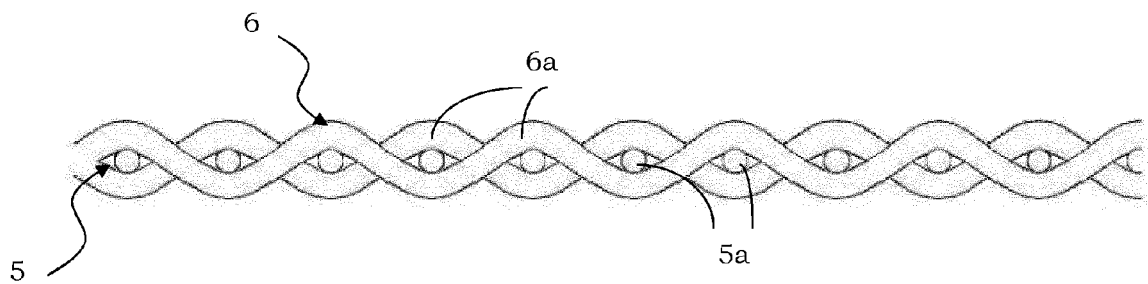


FIG. 4A

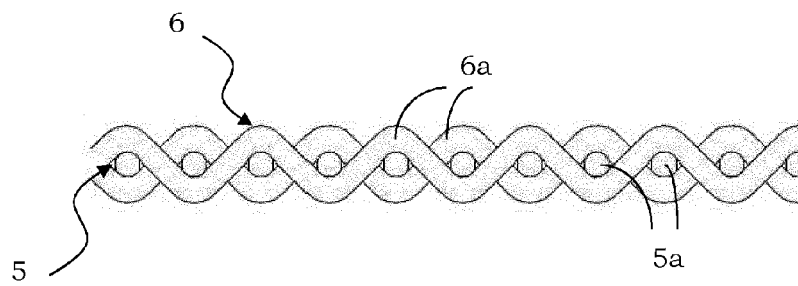


FIG. 4B

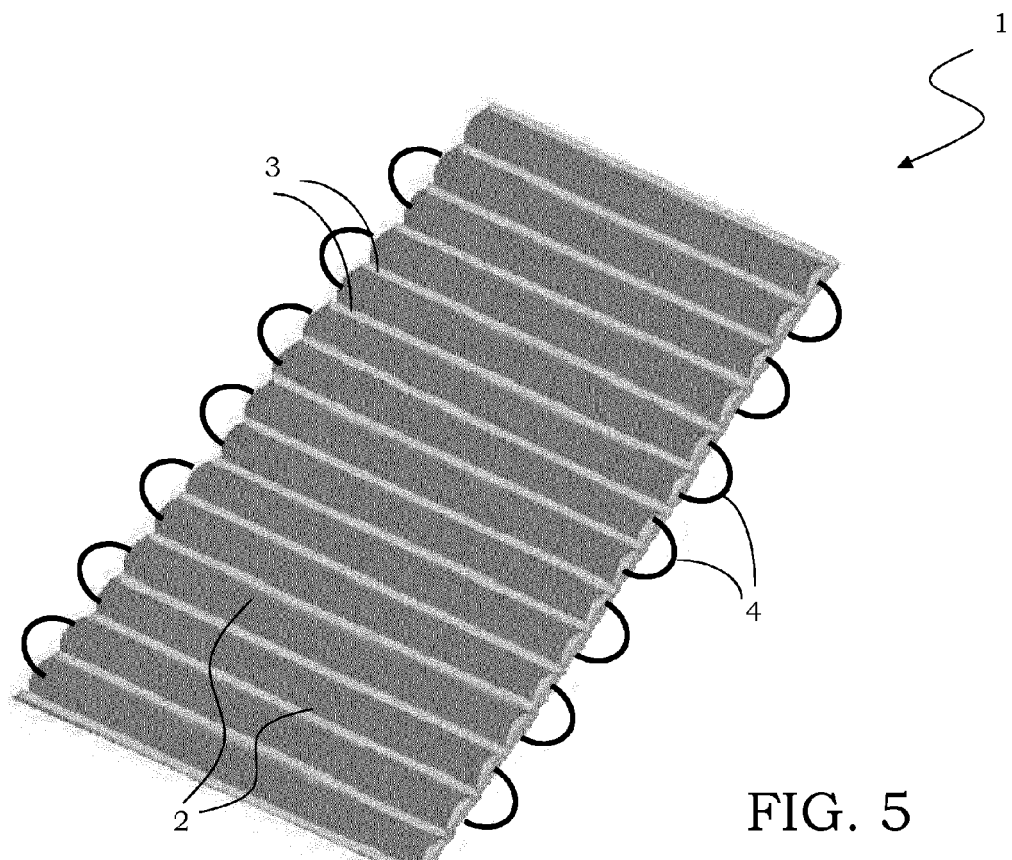


FIG. 5



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Application Number
EP 14 19 6465

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