(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 3 138 944 B1**

(12) **EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention of the grant of the patent:
17.11.2021 Bulletin 2021/46

(51) Int Cl.:
D04B 21/12 *(2006.01)* ***D04C 1/02*** *(2006.01)*
D06P 3/82 *(2006.01)*

(21) Application number: **16187528.1**

(22) Date of filing: **07.09.2016**

(54) LACE FABRIC AND METHOD OF KNITTING LACE FABRIC

SPITZENSTOFF UND VERFAHREN ZUM STRICKEN VON SPITZENSTOFF

TISSU DE DENTELLE ET PROCÉDÉ DE TRICOTAGE DE TISSU DE DENTELLE

(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

(30) Priority: **07.09.2015 JP 2015175512**

(43) Date of publication of application:
08.03.2017 Bulletin 2017/10

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Printed by Jouve, 75001 PARIS (FR)

Description

[Technical Field]

[0001] As one type of a lace fabric, a gradation lace in which a hue sequentially changes in a width direction thereof is known.

[Background Art]

[0002] In a case of manufacturing this type of gradation lace, an original fabric is obtained by knitting a lace having a predetermined background color (typically, white), and one end in a width direction of the original fabric is immersed in a dye, whereby dyeing is performed. In order to obtain the "gradation" which is intended, it is necessary to change the extent of dyeing in a lace width direction, and for example, in a case where the lace width direction end side is dyed strongly and the inside side is dyed weakly, the dyeing density is changed by making the time of immersion in the dye longer going toward the width direction end side. The adjustment of the dyeing time is an operation such as immersing the width direction end side for a long time in a single dyeing operation, or increasing the number of times of dyeing (the number of times of immersion in the dye) going toward the width direction end side.

[0003] Conventionally, this type of work is hand working, and particular related art documents cannot be cited.

[0004] On the other hand, techniques for obtaining a product which is multicolored with respect to each of areas in a single lace fabric by selectively using yarns having different dyeing affinities with respect to a specific dye for each area of a knitted fabric are proposed in Patent Documents 1, 2, and 3, and the like.

[Related art Documents]

[Patent Documents]

[0005]

[Patent Document 1] JP-A-2001-336047
[Patent Document 2] JP-A-2006-37319
[Patent Document 3] JP-A-10-8384

[0006] EP 1 111 111 relates to a warp knit and method of knitting the same.

[0007] JP 2003 041465 relates to a warp knitted fabric with brilliance of iridescent color.

[Summary of the Invention]

[Problem that the Invention is to Solve]

[0008] In a case of performing hand dyeing in order to obtain a gradation lace, there are the following problems.

1. The work is hand working which includes a plurality of dyeing processes, or hand working in which an operation is carried out for a predetermined dyeing time, and therefore, it is substantively impossible to manufacture an intended gradation lace in large amounts and in a short delivery time. According to study by the inventors, although manufacturing is possible in small-quantity production to, for example, about 5000 m, mass production such as 500,000 m is not possible. In a case of intentionally performing this, processing costs become enormous, and a delivery time also becomes a long period of time that is not usually acceptable.
2. In a case of adopting a conventional technique involving the above-described hand working, a lace fabric is dyed with different densities in the width direction thereof, and therefore, the same gradation is made in a knitting direction orthogonal to the width direction. In other words, it is substantively impossible to provide gradation in the knitting direction.
3. Further, in a case of adopting the conventional technique, a lace fabric is dyed with a specific dye on one end side thereof in the width direction, and therefore, if it is intended to create gradation at both ends in the width direction of the lace fabric (gradation of both ends), it is necessary to separately perform work on the one end side and the other end side.

[0009] Although print dyeing is also possible, it is unreasonable to sequentially place a color on specific locations, and if a lace having a large number of holes is a subject, there are cases where it is difficult to apply a distinctive gradation variation to areas having different dyeing degrees in accordance with a lace pattern.

[0010] On the other hand, in the techniques disclosed in Patent Documents 1 and 2, dyeing is performed through complicated stages (Patent Document 1), or the manufacturing of a special twisted yarn is required (Patent Document 2). In the technique disclosed in Patent Document 3, it is not possible to obtain a lace in which a hue sequentially changes.

[0011] An object of the present invention is to obtain a technique in which a gradation lace-like lace which has been conventionally obtained only through a dyeing process by hand working is reasonably and easily obtained, whereby patterning which is required for a lace is possible and it is possible to deal with mass-production.

[0012] Another object of the present invention is to obtain a lace fabric in which a hue sequentially changes not only in a width direction of the lace fabric, but also in a knitting direction of the lace fabric.

[Means for solving the problem]

[0013] In order to achieve the above objects, according to this application, there is provided a lace fabric in accordance with claim 1.

[0014] In order to obtain the lace fabric having this con-

figuration, there is provided a method of knitting a lace fabric in accordance with claim 5.

[0015] The lace fabric having this configuration is provided with the same yarn-type yarn passage part which is interwoven over a plurality of wales on the same course, in the unit area which is configured to be provided with a predetermined number of courses. That is, a site (an area) in which the same yarn type (in other words, yarns which are dyed to the same hue) extends in a course direction which is the width direction of the lace fabric is formed, and with respect to different yarn types, the same yarn-type yarn passage parts of different yarn types are disposed to be distributed in the knitting direction of the lace fabric. In the distributed disposition, the same yarn-type yarn passage parts of two yarn types may be disposed to be evenly distributed in a form such as every course or every two courses in the knitting direction of the lace fabric, and the same yarn-type yarn passage parts may be disposed while changing the length or the appearance proportion of the same yarn-type yarn passage part, or both of them, in accordance with the form of an intended pattern.

[0016] Due to this configuration, after dyeing, same yarn-type yarn passage parts having different colors appear on the surface to be distributed according to a design of a knitting weave. Further, in the comparison between the unit areas, each of which is configured to be provided with a predetermined number of courses, the gradation-like weave in which the density of the first fiber is sequentially increased in at least three stages with respect to the density of the second fiber in the comparison between the unit areas which are disposed in the width direction of the lace fabric is made.

[0017] That is, with regard to the width direction of the lace fabric, in the comparison between the unit areas, the proportion of the same yarn-type yarn passage part changes in a stepwise fashion, whereby it is possible to make a configuration in which the density becomes, for example, high with respect to the first fiber (becomes, for example, low with respect to the second fiber). Here, a unit area in which there is 100% of the first fiber and 0% of the second fiber may be formed, and a unit area in which there is 0% of the first fiber and 100% of the second fiber may be formed. However, in at least the intermediate stage among three stages which change in a stepwise fashion, an area in which the first fiber is included in a predetermined percentage and the second fiber is included in a corresponding percentage is present.

[0018] With regard to the changes in proportion, it becomes possible to perform the adjustment of density between the unit areas by the adjustment of the length in the lace width direction of the same yarn-type yarn passage part, the adjustment of the number of courses as described below, and furthermore, the adjustment of the thickness or the like of a yarn which is used in the area.

[0019] If the lace fabric knitted in this manner is dyed, the first fiber and the second fiber which have different dyeing affinities exhibit different hues due to dyeing by a specific dye. Further, the densities of these fibers are sequentially changed in at least three stages, and therefore, a lace fabric exhibiting an external appearance similar to gradation can be obtained simply by uniformly dyeing the whole of the knitted lace fabric.

[0020] Of course, it is also possible to make the respective fibers have the intended specific colors by using a dye with respect to the first fiber and using a different dye with respect to the second fiber.

[0021] As a result, the problem of hand working which has become problematic in the prior art can be successfully resolved.

[0022] Further, it is preferable that in order to sequentially increase the density of the first fiber with respect to the density of the second fiber in the comparison between the unit areas, the greater the density of the first fiber in the area needs to be, the further the number of same yarn-type yarn passage parts which include the first fiber is increased.

[0023] The lace fabric having this configuration can be knitted by a method having a feature that in order to sequentially increase the density of the first fiber with respect to the density of the second fiber in the comparison between the unit areas, the greater the density of the first fiber in the area needs to be, the further the number of same yarn-type yarn passage parts which include the first fiber is increased.

[0024] As indicated previously, the adjustment of the density of the first fiber and the density of the second fiber can be performed with a simpler technique by the adjustment of the number of courses with respect to the number of courses which include the first fiber which is included in the unit area which includes a predetermined number of courses, and the number of courses which include the second fiber which is included in the unit area, and thus it is possible to relatively easily obtain the intended gradation lace.

[0025] Further, it is preferable that the same yarn-type yarn passage part is formed as a same yarn-type continuous part in which the wefts or the interweaving yarns which are of the same yarn type and are different are continuous in the width direction of the lace fabric and that the greater the density of the first fiber in the area needs to be, the further the number of same yarn-type continuous parts in the knitting direction of the lace fabric is increased.

[0026] The lace fabric having this configuration can be knitted by a method having the feature that the same yarn-type yarn passage part is formed as the same yarn-type continuous part in which the wefts or the interweaving yarns which are of the same yarn type and are different are continuous in the width direction of the lace fabric, and the greater the density of the first fiber in the area needs to be, the further the number of same yarn-type continuous parts in the knitting direction of the lace fabric is increased.

[0027] With regard to the same yarn-type yarn passage part which has been described hitherto, whether the part

(area) is formed by a single weft or a single interweaving yarn or formed by a plurality of wefts or a plurality of interweaving yarns, is not mentioned (in other words, it is not limited). In general, in a warp knitted fabric, there is a limit to the number of wales in which a single weft or a single interweaving yarn can perform a traverse (for example, in the case of a Leavers machine, the number of wales is 5). Therefore, if the same yarn-type yarn passage part is formed by only a single weft or a single interweaving yarn, a limit occurs in the length thereof.

[0028] In contrast, due to forming the same yarn-type yarn passage part as the same yarn-type continuous part by using a combination of the width direction arrangements of a plurality of yarns, the length in the lace fabric width direction of the same yarn-type yarn passage part can be freely adjusted, and thus the degree of gradation (the degree of change of a color in the width direction) can be freely adjusted and the selectivity of a pattern is also remarkably improved.

[0029] Further, in this lace fabric, the same yarn-type continuous part can have a configuration in which it is continuously knitted in the width direction of the lace fabric by making a number of wefts or interweaving yarns corresponding to the number of wales which are disposed in the width direction of the lace fabric perform a traverse.

[0030] By adopting this configuration, a lace fabric specific to this application can be realized, for example, by making the weft or the interweaving yarn which is sequentially interwoven between wales adjacent to each other the same yarn type.

[0031] Further, in the lace fabric which has been described hitherto, it is preferable that a third fiber is used for a yarn of a part of the weft or the interweaving yarn, and a fourth fiber is used for a yarn of the other part of the weft or the interweaving yarn, which is different from the weft or the interweaving yarn composed of the third fiber, a fiber thicker than the fourth fiber is used as the third fiber, and with regard to a knitting weave in the knitting direction of the lace fabric, an area in which a density of the third fiber is higher than a density of the fourth fiber in a comparison between the unit areas in the knitting direction is formed.

[0032] The lacing fabric having this configuration can be realized by using a third fiber for a yarn of a part of the weft or the interweaving yarn, using a fourth fiber for a yarn of the other part of the weft or the interweaving yarn, which is different from the weft or the interweaving yarn composed of the third fiber, using a fiber thicker than the fourth fiber as the third fiber, and forming, with regard to the knitting weave in the knitting direction of the lace fabric, the area in which the density of the third fiber is higher than the density of the fourth fiber in the comparison between the unit areas in the knitting direction.

[0033] The technique described hitherto is a technique for applying gradation in the lace fabric width direction. However, by providing the third fiber and the fourth fiber in the knitting direction and changing the thickness of a yarn, it becomes possible to apply a change to a hue after dyeing according to a change in density, even in a configuration using the same type of fiber.

[0034] Here, the thicker a yarn (the higher the density), the thicker a hue becomes, and the thinner a yarn (the lower the density), the thinner a hue becomes.

[0035] With respect to the selection of a yarn type, each of the third fiber and the fourth fiber may be either of the first fiber or the second fiber described previously, and another yarn type may be adopted. As an example of a case where another type is selected, it is also possible to use cation as the first fiber, nylon as the second fiber, and viscose rayon as the third fiber and the fourth fiber.

[Advantages of the Invention]

[0036] As described above, a gradation lace which this application intends to obtain can be obtained by mechanically knitting a lace by providing a gradation-like change to the density of each of the first fiber and the second fiber per unit area by utilizing the same yarn-type yarn passage part (the same yarn-type continuous part) in a weave design stage of a lace fabric, and carrying out a predetermined dyeing operation. That is, it is possible to reveal any gradation at a fixed location.

[0037] Due to this technique, dyeing in the state of cloth becomes possible and a gradation product can be mass-produced.

[Brief Description of the Drawings]

[0038]

Figs. 1A and 1B are diagrams showing the external appearance of a gradation lace according to the invention of this application.

Figs. 2A and 2B are explanatory diagrams of the configuration of a Leavers lace.

Figs. 3A to 3D are explanatory diagrams for describing a technique of density adjustment according to a yarn type.

Fig. 4 is an enlarged view of a section A of Fig. 1A.

Fig. 5 is an explanatory diagram showing a weave configuration of a same yarn-type continuous part 3 formed at an area Zm (a knitting direction length E) of Fig. 4.

Fig. 6 is an enlarged view of a section B in Fig. 1A enlarged to an extent smaller than the extent of enlargement in Fig. 4.

Figs. 7A to 7D are explanatory diagrams corresponding to Figs. 3A to 3D, in a case where the technique according to this application is realized in a Raschel knitted fabric.

[Best Mode for Carrying Out the Invention]

[0039] An embodiment of this application will be described based on the following drawings.

[0040] Fig. 1A is a diagram showing an external appearance when a lace fabric 1 which is a warp knitted fabric is viewed from the front surface side.

[0041] The feature of this application is that the color tone of the lace fabric 1 which is a warp knitted fabric sequentially transitions in a width direction D1 of the lace fabric, in an external appearance, as also shown in the drawings. In this example, in the width direction D1 of the lace fabric, the color tones of both right and left end sites Ze, both intermediate sites Zm on the inside thereof, and central sites Zc on the inside thereof sequentially change. The enlargement of the weave of a section A in this drawing is shown in Fig. 4, and the enlargement of the weave of a section B is shown in Fig. 6. Fig. 5 is an enlarged view of the weave of an area Zm in Fig. 4. The enlargement factor of Fig. 6 is smaller than the enlargement factor of Fig. 4.

[0042] In the following description, a case of manufacturing a Leavers lace fabric 1 by using a Leavers machine (not shown) which is a preferred embodiment will be first described. Further, also with regard to a yarn which is used, a specific example is shown. However, these examples are merely preferred examples.

[0043] A weave in a case where the Leavers lace fabric 1 is viewed from the knitted fabric front surface side is shown in Figs. 2A and 2B. As shown in Fig. 2A, in the Leavers lace fabric 1, a bobbin yarn 7 (yarn type: nylon, thickness: a range of 30 to 50 deniers) which forms a foundation of the weave and extends in a knitting direction D2 which is referred to as a wale W in a warp knitted fabric is provided as a warp, and a back warp BW (yarn type: nylon covered yarn with polyurethane as a core, thickness: a range of 140 to 420 deniers) is interwoven with the bobbin yarn 7 in the width direction of the knitted fabric. Further, with respect to a weave composed of the bobbin yarn 7 and the back warp BW, a front warp FW (yarn type: nylon, thickness: a range of 30 to 50 deniers) is interwoven on the front side of the back warp BW. The back warp BW and the front warp FW serve as wefts for configuring a base weave 4 (a net N) of a warp knitted fabric.

[0044] A weaving direction of each of the back warp BW and the front warp FW, or a gimp yarn 8 and a liner yarn 9 (both of which will be described later) becomes the width direction D1 of the lace fabric, which is orthogonal to the knitting direction D2 described previously.

[0045] A yarn stroke motion of each of the back warp BW and the front warp FW is to making interweaving proceed by performing a traverse between the bobbin yarns 7 adjacent to each other or between a predetermined number of bobbin yarns 7 in the same course C, and the back warp BW has a form in which it is located on the back surface side of the bobbin yarn 7 when the yarn performs a rightward traverse with respect to the bobbin yarn 7, and located on the front surface side of the bobbin yarn 7 at the time of a leftward traverse, when viewed from the front surface side of a knitted fabric, as shown in Fig. 2A. Conversely, the front warp FW is knitted so as to be located on the front surface side at the time of a rightward traverse with respect to the bobbin yarn 7 and be located on the back surface side at the time of a leftward traverse.

[0046] The base weave 4 of the Leavers lace fabric 1 is completed with the bobbin yarn 7 (a warp), the back warp BW (a weft), and the front warp FW (a weft). Further, in the Leavers lace fabric 1, for the purpose of patterning or the like, with respect to the base weave 4, the gimp yarn 8 (yarn type: cation, nylon, cotton, or the like, thickness: a range of about 50 to 150 deniers) is inserted between the front warp FW and the back warp BW, and the liner yarn 9 (yarn type: nylon, cation, cotton, or the like, thickness: about 300 deniers) is inserted on the front surface side of the front warp FW, as shown in Fig. 2B.

[0047] Fig. 2B is a weave in which a single representative gimp yarn 8 and a single representative liner yarn 9 are inserted in the base weave 4 of Fig. 2A. As can also be seen from this drawing, the same yarn stroke motion as that of the back warp BW described previously is performed in the gimp yarn 8, and the same yarn stroke motion as that of the front warp FW is performed in the liner yarn 9.

[0048] In the case of the Leavers lace fabric 1, the number of gimp yarns 8 is generally about 60 pieces and the number of liner yarns 9 is also generally about 60 pieces.

[0049] In this application, a hue that appears on the front surface side of the lace fabric 1 is regarded as a problem, and therefore, mainly, a yarn use (selection of a yarn type) of the liner yarn 9 becomes problematic. Further, the liner yarn 9 plays a major role in the formation of a pattern, and therefore, with respect to a weft, a thick yarn is adopted.

[0050] As described above, the Leavers lace fabric 1 is composed of a liner yarn layer 90, a front warp layer FWL, a gimp yarn layer 80, and a back warp layer BWL from the front surface side, as shown in Fig. 1B, if the knitted fabric is viewed in a thickness direction T thereof.

[0051] The positional relationship in a knitted fabric front-and-back direction between the respective yarns is determined by the positional relationship between reeds in a knitting operation. In a relationship of configuring a knit, it goes without saying that the respective yarns are interwoven with each other to follow the configuration shown in Fig. 2B in the front-and-back direction.

[0052] It is also possible to adopt a configuration in which from the front surface side of the lace fabric 1, the liner yarn layer 90, the gimp yarn layer 80, the front warp layer FWL, and the back warp layer BWL are disposed, in which although it is the disposition in a Leavers lace fabric front-and-back direction T of the respective layers (the liner yarn layer 90, the front warp layer FWL, the gimp yarn layer 80, and the back warp layer BWL) in the lace fabric 1 described above, a positional relationship in which the front warp layer FWL and the gimp yarn layer 80 are reversed in the front-and-back direction is made.

[0053] Next, a characteristic configuration of this ap-

plication for obtaining gradation as shown in Fig. 1A in the Leavers lace fabric 1 will be described. In the description, Figs 3A to 6 are appropriately used. In the gradation lace according to this application, a hue appearance when the lace is viewed from the front side becomes problematic, and therefore, a yarn (mainly, the liner yarn 9 described previously) which appears to the exterior at each site of the lace becomes problematic. However, depending on a lace site, an area in which the gimp yarn 8, the front warp FW, or the back warp BW is exposed also exists.

1. Yarn Use

[0054] As described hitherto, in the Leavers lace fabric 1 according to this application, two or more types of fibers which include at least a first fiber and a second fiber which have different dyeing affinities with respect to a specific dye are used as the weft (the back warp BW or the front warp FW), the interweaving yarn (the liner yarn 9 or the gimp yarn 8), or both of them,

[0055] In the following description, in order to facilitate understanding, there is a case where a yarn which is exposed is described to be referred to as an "exposed yarn". Further, a combination of the first fiber and the second fiber is regarded as being, for example, a combination of nylon and cation. As a dye, with respect to nylon, an acid dye is used, and with respect to cation, a cation dye is used. Further, in a case of using a cotton yarn or viscose rayon, a reactive dye is used. Therefore, in a case where a knitted fabric which includes two types of yarns of these is dyed by the same dye, a color difference according to a yarn type is exposed. Further, in a case where it is desired to dye the first fiber by a specific first dye and dye the second fiber by a specific second dye, it is favorable if dyes suitable for color development of the respective fibers are selected and a dyeing operation is performed. In this case, dyeing may be performed by a single bath-dyeing, and dyeing may be sequentially performed by using the respective dyes. However, by dyeing an original fabric knitted in a predetermined weave form, it is possible to obtain gradation which this application intends to obtain.

[0056] In the case of the example shown in Fig. 1, both end sites Ze are provided at both right and eft end sites in the width direction D1 of the lace fabric, the intermediate sites Zm are provided at both sites on the inside thereof, and the central sites Zc are provided at the central site.

[0057] This example is an example in which an exposed yarn of each of both end sites Ze is set to be a cation single yarn type, exposed yarns of the intermediate site Zm are set to be a yarn use of cation and nylon, and an exposed yarn of the central site Zc is set to be a yarn use of a nylon single yarn type. The thickness of each of yarns forming these patterns is about 300 deniers, because it is basically the liner yarn 9.

[0058] In the net N which is seen through, as the front warp FW or the back warp BW, a fine yarn (fine with respect to the liner yarn) is used according to a yarn use of the site. Here, the expression, according to a yarn use of the site, refers to using, for example, in a case where the liner yarn of a corresponding site is a nylon yarn, a fine nylon yarn for the front warp FW of the corresponding site, and using a fine nylon yarn or polyester yarn as the back warp BW.

[0059] That is, the density of a color changes at an area a1 and an area a2 which are shown in the left of Fig. 4. However, this change is due to adopting yarns having different thicknesses in a configuration in which the same type of yarn is used, as will be described later. A nylon fiber (an example of a third fiber; this yarn has a thickness of about 300 deniers, because it is the liner yarn 9) which is used in a part a2 is thicker than a nylon fiber (an example of a fourth fiber; this yarn has a thickness in a range of 30 to 40 deniers, because it becomes the front warp FW) which is used in a part a1 which is the net part N.

[0060] In this manner, in this application, first, there is a feature in a yarn use taking dyeing into account, and also with regard to the structure of the knitting weave, a device is made.

[Same Yarn-type Yarn Passage Part]

[0061] In the lace fabric according to this application, a knitting weave in the width direction D1 of the lace fabric is formed to be provided with a same yarn-type yarn passage part 2 in which the same yarn-type of yarn passes through the same course over a plurality of wales.

[0062] The specific configuration will be described with reference to Figs. 3A to 3D, 4, and 5.

[0063] Figs. 3A to 3D are an explanatory example for facilitating the understanding of the characteristic configuration according to this application, and this example is an example in which the same yarn-type yarn passage part 2 is configured of a single liner yarn 9, and in each of the same yarn-type yarn passage parts 2, the liner yarn 9 performs reciprocating yarn passage with four wales W as a unit.

[0064] Further, with regard to different yarn types (a cation liner yarn as the second fiber is shown by 9c and a nylon liner yarn as the first fiber is shown by 9n), the following configuration is adopted. In an area Ze shown in Fig. 3A, this area is formed with only the cation liner yarn 9c as the second fiber. Further, in an area Zm1 on the right side moved in the lace fabric width direction D1, as shown in Fig. 3B, a same yarn-type yarn passage part 2c of the second fiber and a first fiber yarn passage part 2n are alternately distributed with two courses as a unit, whereby this area is formed. Further, in an area Zm2 shown in Fig. 3C, the same yarn-type yarn passage part 2c of the second fiber is disposed over two courses, and the first fiber yarn passage part 2n is disposed over four courses. Further, in an area Zc shown in Fig. 3D, this area is formed with only the nylon liner yarn 9n as the

first fiber. Figs, 3A to 3D are schematic diagrams in a case where a lace fabric is divided in the width direction D1 thereof, and the gist of the present invention can be easily understood by arranging these drawings sideways in the width direction D1. The same applies to Figs. 7A to 7D which will be described later.

[0065] The example shown in Fig. 1 is an example designed according to the same concept as that in Figs. 3A to 3D, and each of both end sites Ze adopts a configuration similar to Fig. 3A, and the central site Zc adopts a configuration similar to Fig. 3D. The intermediate site Zm is configured by arranging the areas Zm1 and Zm2 and corresponds to each of Figs. 3B and 3C. However, a variety of devisals are made with regard to the yarn stroke motion, the setting of the length in the lace fabric width direction D1 of the same yarn-type yarn passage part 2, or the like.

[0066] Hereinafter, description will be made using Figs. 4 and 5.

[0067] In these drawings, a straight line extending in a vertical direction indicates the position of the bobbin yarn 7 which is a warp in the Leavers lace fabric 1 (the position of the wale W), and a thick solid line corresponds to each of a plurality of cation liner yarns 9c, and a thick broken line corresponds to each of a plurality of nylon liner yarns 9n. Further, a fine solid line corresponds to each of a plurality of front warps FW and back warps BW.

[0068] Each of these lines shows a form of yarn passage of each yarn passing between the wales W.

[0069] In Fig. 4, a yarn stroke motion part of a pair of cation liner yarns 9c which is present at a left end of the drawing is an end ornament part 20 of the lace fabric 1, which is generally referred to as a "scallop". One of both end sites Ze which has been described hitherto is shown on the inside thereof, and the intermediate site Zm (Zm1 and Zm2) and the central site Zc are located on the right thereof. The yarn use (a difference in yarn use between cation and nylon) in these sites is as described previously.

[0070] On the other hand, with regard to the yarn stroke motion, as in the example explanatorily shown in Figs. 3A to 3D, in addition to a structure in which a yarn reciprocates between the same wales W with two courses which are in succession in the knitting direction D2 as a unit, various configurations such as reciprocating between the wales W with several courses skipped (the same yarn-type yarn passage part 2 of another type of yarn is provided ad interim over a plurality of courses), in addition to reciprocating between the different wales W (that is, the liner yarn moves in the lace width direction D1), are adopted.

[0071] Further, an object of this application is also to adopt the following configuration in order to make the same yarn-type yarn passage part 2 have a distinctive distribution state.

[0072] That is, in the example shown in Figs. 4 and 5, in addition to an example in which the same yarn-type yarn passage part 2 described in Figs. 3A to 3D is configured with a single liner yarn 9, an example in which the same yarn-type yarn passage parts 2 are configured with a plurality of liner yarns 9 to be continuous in the width direction D1 of the lace fabric is also shown. Fig. 5 is enlargement of an area shown by Zm in the lace fabric width direction D1 and shown by E in the knitting direction D2 in Fig. 4.

[0073] For example, at the lower left of Fig. 5, the same yarn-type yarn passage part 2c of cation is continuously formed at a location elevated by four courses from the bottom of the drawing, and the liner yarns 9c, 9c, and 9c which are of the same yarn type and are different are formed as a same yarn-type continuous part 3 which is continuous in the width direction D1 of the lace fabric. From the left side of the drawing, the liner yarns 9c respectively perform a traverse over six, four, and two wales, and a location at which separate liner yarns 9c and 9c overlap at the same wale W is formed, whereby the continuity thereof is secured. As a result, a configuration is made in which the same yarn-type yarn passage part 2 forms the same yarn-type continuous part 3 in a state of passing over ten wales. In the vicinity thereof, the same weave is adopted at a location advanced by one course in the knitting direction, and a location further advanced by three courses.

[0074] On the other hand, at the upper right of Fig. 5, the same yarn-type yarn passage part 2n of nylon is continuously formed at a location returned by seven courses from the top of the drawing, and the liner yarns 9n and 9n which are of the same yarn type and are different are formed as the same yarn-type continuous part 3 which is continuous in the width direction D1 of the lace fabric. From the left side of the drawing, the liner yarns 9n respectively perform a traverse over five and two wales, and a location at which separate liner yarns 9n and 9n overlap at the same wale W is formed, whereby the continuity thereof is secured. As a result, a configuration is made in which the same yarn-type yarn passage part 2 forms the same yarn-type continuous part 3 in a state of passing over six wales. In the vicinity thereof, the same weave is adopted at a location returned by one course in the knitting direction, and a location further returned by two courses.

[0075] The same yarn-type continuous part 3 may be continuously knitted in the width direction of the lace fabric by making a number (the number of wales equal to 1, half of the number of wales, or the like) of wefts or interweaving yarns corresponding to the number of wales which are disposed in the width direction of the lace fabric perform a traverse.

[0076] As described above, in the gradation lace according to this application, the knitting is advanced while forming the same yarn-type yarn passage part 2 (the same yarn-type continuous part 3 is also acceptable). However, in order to exhibit gradation after dyeing, in the lace fabric 1, the same yarn-type yarn passage parts 2 (the same yarn-type continuous parts 3 are also acceptable) of different yarn types are disposed to be distributed

in the knitting direction of the lace fabric with regard to a unit area composed of a predetermined number of courses (in the example shown in Figs. 3A to 3D, sixteen courses), and thus a gradation-like weave is made in which the density of the first fiber is sequentially increased in at least three stages with respect to the density of the second fiber in the comparison between the unit areas which are disposed in the width direction D1 of the lace fabric 1 (in the example described, the density of nylon is sequentially increased in at least three stages).

[0077] In other words, as shown in Figs. 3A to 3D, in order to sequentially increase the density of the first fiber with respect to the density of the second fiber in the comparison between the unit areas, the greater the density of the first fiber in the area needs to be, the further the number of same yarn-type yarn passage parts 2 which include the first fiber is increased.

[0078] Further, as shown in the example of Figs. 4 and 5, if the same yarn-type continuous part 3 is provided, the length of the same yarn-type yarn passage part 2 can be appropriately adjusted, and therefore, when viewed in the knitting direction, the exposed state of a different yarn is arbitrarily adjusted.

[0079] On the other hand, regarding the same yarn type, with respect to the thickness thereof, as can also be seen from the comparison between, for example, the areas a1 and a2 shown in the upper left in the weave shown in Fig. 4 (here, in a2, the nylon liner yarn 9n is the exposed yarn, and in a1, the front warp FW is the exposed yarn), the thickness thereof is changed between the same yarn-type yarn passage parts (the same yarn-type continuous parts are also acceptable) which are disposed in the knitting direction D2 of the lace fabric. As a result, in an external appearance, it is possible to obtain gradation in the knitting direction.

[0080] That is, by being provided with the third fiber and the fourth fiber as the weft and the interweaving yarn, using a fiber thicker than the fourth fiber as the third fiber, and forming an area in which the density of the third fiber is higher than the density of the fourth fiber in the comparison between the unit areas in the knitting direction with regard to the knitting weave in the knitting direction of the lace fabric, the gradation in the knitting direction can be realized, in addition to the gradation in the width direction described hitherto.

[0081] Further, as shown in Fig. 6, for example, in the section B of Fig. 1, a configuration can be made which sequentially transitions from a yarn combination in which the nylon liner yarn 9n develops a color, to a color which the cation liner yarn 9c develops, and thereafter, returns back to the color on the cation side again in the lace fabric width direction.

[Other Embodiments]

[0082]

1. In the embodiment described above, specific yarns are adopted as the bobbin yarn 7, the back warp BW, the front warp FW, the gimp yarn 8, and the liner yarn 9. However, this application is not limited to the selection of the yarn types described above.

2. As examples of fibers having different dyeing affinities, in addition to the above-described combination of (cation and nylon), a combination of (nylon and viscose rayon) and a combination of (nylon and cotton) is also possible. A combination of these and cotton is also possible, and in addition to a combination of two yarn types, a configuration which includes three or more types having different dyeing affinities may be adopted.

3. With regard to the configuration of the same yarn-type yarn passage part 2, the site may be formed with a single weft or a single interweaving yarn and may also be formed with a plurality of yarns. The same also applies to the same yarn-type continuous part 3. In a case of using a plurality of yarns, the length in the lace width direction becomes optional.

4. Further, with regard to the unit area composed of a predetermined umber of courses, the proportion of the same yarn-type yarn passage part 2 composed of each yarn type can be arbitrarily adjusted. The exposures of the same yarn-type yarn passage parts 2 composed of another type of yarn are distributed in the knitting direction of the lace fabric. As a result, it is possible to satisfactorily obtain a gradation-like weave. Here, if even distribution is made, a structure in which a change of gradation is not very conscious can be made. Further, in the width direction D1 of the lace fabric, in addition to adopting four stages (Ze, Zm1, Zm2, and Zc), as shown in the embodiment, if three or more stages are adopted, it becomes possible to obtain a gradation-like lace.

5. In the embodiment described above, the case of the Leavers lace fabric 1 is shown. However, this application can also be applied to a Raschel fabric which is knitted by a Raschel warp knitting machine. With regard to the Raschel fabric, weave diagrams corresponding to Figs. 3A to 3D are Figs. 7A to 7D, and a base weave is configured of a chain stitch yarn 71 which is a warp, and a net yarn (not shown) which is a weft. There is also a case where a stretch yarn (not shown) is inserted into a predetermined wale W or between the wales W in order to provide stretchability to a knitted fabric. Further, in a state of being bundled by the chain stitch, a plurality of insertion yarns 72 are inserted according to the position and movement of a corresponding reed. The selection states of the weaves and yarn types (a cation insertion yarn 72c and a nylon insertion yarn 72n) of the yarn are shown in Figs. 7A to 7D. It can be seen that the density of nylon increases as it goes toward the right side.

6. In the embodiment described above, as the unit area, for example, the area having a predetermined

number of wales and courses, as shown in Figs. 3A to 3D and 7A to 7D, has been described. However, with regard to the unit area, it is favorable if the unit area is provided with the number of wales and the number of courses to the extent that can be compared, and basically, it is possible to make a knitting weave area having three or more wales and three or more courses the unit area. As shown in Figs. 3A to 3D and 7A to 7D, it is preferable that an object for a comparison is made to have four wales and about sixteen courses (sixteen to twenty-six courses).

[Industrial Applicability]

[0083] It is possible to obtain a technique capable of mass-producing a gradation lace having high decorative properties.

[0084] Further, if gradation is provided in the knitting direction as well, the value of a lace can be significantly increased.

[Description of Reference Numerals and Signs]

[0085]

1: Leavers lace fabric 1 (an example of warp knitted fabric)
2: same yarn-type yarn passage part
3: same yarn-type continuous part
4: base weave
5: interweaving yarn
7: bobbin yarn (warp)
8: gimp yarn (interweaving yarn 5)
9: liner yarn (interweaving yarn 5)
20: end ornament part 20
80: gimp yarn layer
90: liner yarn layer
W: wale
BW: back warp (weft)
BWL: back warp layer
FW: front warp (weft)
FWL: front warp layer
D1: lace fabric width direction
D2: knitting direction
T: thickness direction

Claims

1. A lace fabric (1) which is knitted with a base weave (4) composed of wales (W) and wefts (BW, FW), which are interwoven with the wales, and interweaving yarns (9) which are interwoven into the base weave,

wherein the interweaving yarns are configured of yarns of different fiber types which include at least a first fiber (9n) and a second fiber (9c),

wherein the lace fabric is provided in a width direction (D1) with parts (2n or 2c) in which interweaving yarns of the same fiber type pass through the same course over a plurality of wales (W), adjoined in a knitting direction (D2) of the lace fabric by parts (2c or 2n) in which interweaving yarns of different fiber type pass through the same course over a plurality of wales,

characterized in that the at least first fiber and second fiber have different dyeing affinities with respect to a specific dye, and the lace fabric is a gradation lace wherein with regard to unit areas (Zc, Zm1, Zm2, Ze) which are disposed in the width direction (D1) of the lace fabric and which are each composed of a predetermined number of courses, and

when a comparison is made between interweaving yarns exposed to the front side of the fabric, a gradation-like weave in which a density of the first fiber (9n) is sequentially increased in at least three stages with respect to a density of the second fiber (9c) in a comparison between the unit areas is made.

2. The lace fabric according to Claim 1, **characterized in that** in order to sequentially increase the density of the first fiber (9n) with respect to the density of the second fiber (9c) in the comparison between the unit areas, the greater the density of the first fiber in the area needs to be, the further the number of the parts (2n) in which yarns of the first fiber pass through the same course over a plurality of wales is increased.

3. The lace fabric according to Claim 1 or 2, **characterized in that** when a comparison is made between the interweaving yarns exposed to the front side of the fabric, the unit areas include a unit area (Zc) in which the interweaving yarns exposed to the front side of the fabric are composed of only the first fiber (9n), and a unit area (Ze) in which the interweaving yarns exposed to the front side of the fabric are composed of only the second fiber (9c).

4. The lace fabric according to Claim 1 or 2, **characterized in that** the lace fabric is a Leavers lace fabric, the wefts include front warps (FW) and back warps (BW), the interweaving yarns include gimp yarns (8), first liner yarns (9n) of the first fiber and second liner yarns (9c) of the second fiber.

5. A method of knitting a lace fabric (1) which is knitted with a base weave (4) composed of wales (W) and wefts (BW, FW) which are interwoven with the wales, and interweaving yarns (5) which are interwoven into the base weave,

wherein the interweaving yarns are configured of yarns of different fiber types which include at least a

first fiber (9n) and a second fiber (9c), the method comprising:

providing a lace fabric in a width direction (D1) with parts (2n or 2c) in which interweaving yarns of the same fiber type pass through the same course over a plurality of wales;
making the parts (2n or 2c) adjoined in a knitting direction (D2) of the lace fabric by parts (2c or 2n) in which interweaving yarns of different fiber type pass through the same course over a plurality of wales;
characterized in selecting the at least first fiber and second fiber to have different dyeing affinities with respect to a specific dye,
forming a gradation lace having, with regard to unit areas (Zc, Zm1, Zm2, Ze) which are disposed in the width direction (D1) of the lace fabric and which are each composed of a predetermined number of courses; and
when a comparison is made between the interweaving yarns exposed to the front side of the fabric, a gradation-like weave in which a density of the first fiber (9n) is sequentially increased in at least three stages with respect to a density of the second fiber (9c) in a comparison between the unit areas.

6. The method of knitting a lace fabric according to Claim 5, **characterized in that** in order to sequentially increase the density of the first fiber (9n) with respect to the density of the second fiber (9c) in the comparison between the unit areas, the greater the density of the first fiber in the area needs to be, the further the number of the parts (2n) in which yarns of the first fiber pass through the same course over a plurality of wales is increased.

7. The method of knitting a lace fabric according to Claim 5 or 6,
characterized in that when a comparison is made between the interweaving yarns exposed to the front side of the fabric, the unit areas include a unit area (Zc) in which interweaving yarns exposed to the front side of the fabric are composed of only the first fiber (9n), and a unit area (Ze) in which interweaving yarns exposed to the front side of the fabric are composed of only the second fiber (9c).

8. The method of knitting a lace fabric according to Claim 5 or 6,
characterized in that the lace fabric is a Leavers lace fabric, the wefts include front warps (FW) and back warps (BW), the interweaving yarns include gimp yarns (8), first liner yarns (9n) of the first fiber and second liner yarns (9c) of the second fiber.

Patentansprüche

1. Spitzenstoff (1), der mit einem Grundgewebe (4), bestehend aus Maschenstäbchen (W) und Schussfäden (BW, FW), die mit den Maschenstäbchen verwoben sind, und eingewebten Garnen (9), die in das Grundgewebe eingewebt sind, gewirkt ist,

wobei die eingewebten Garne aus Garnen aus unterschiedlichen Faserarten gebildet sind, die mindestens eine erste Faser (9n) und eine zweite Faser (9c) beinhalten,
wobei der Spitzenstoff in einer Breitenrichtung (D1) mit Teilen (2n oder 2c) versehen ist, bei denen eingewebte Garne derselben Faserart durch denselben Lauf über mehrere Maschenstäbchen (W) laufen, und die in einer Wirkrichtung (D2) des Spitzenstoffs an Teile (2c oder 2n) angrenzen, bei denen eingewebte Garne von unterschiedlicher Faserart durch denselben Lauf über mehrere Maschenstäbchen laufen,
dadurch gekennzeichnet, dass die mindestens erste Faser und zweite Faser unterschiedliche Farbstoffaffinitäten in Bezug auf einen spezifischen Farbstoff aufweisen, und der Spitzenstoff eine Abstufungsspitze ist, wobei
in Bezug auf Einheitsbereiche (Zc, Zm1, Zm2, Ze), die in der Breitenrichtung (D1) des Spitzenstoffs angeordnet sind und die jeweils aus einer vorbestimmten Anzahl an Läufen bestehen, und wenn ein Vergleich zwischen eingewebten Garnen, die an der Vorderseite des Stoffs freiliegend sind, vorgenommen wird, ein abstufungsartiges Gewebe hergestellt ist, bei dem eine Dichte der ersten Faser (9n) in Bezug auf eine Dichte der zweiten Faser (9c) in einem Vergleich zwischen den Einheitsbereichen sequenziell in mindestens drei Stufen erhöht ist.

2. Spitzenstoff nach Anspruch 1, **dadurch gekennzeichnet, dass** zur sequenziellen Erhöhung der Dichte der ersten Faser (9n) in Bezug auf die Dichte der zweiten Faser (9c) in dem Vergleich zwischen den Einheitsbereichen die Anzahl an Teilen (2n), bei denen Garne der ersten Faser durch denselben Lauf über mehrere Maschenstäbchen laufen, desto weiter erhöht wird, je größer die Dichte der ersten Faser in dem Bereich sein muss.

3. Spitzenstoff nach Anspruch 1 oder 2,
dadurch gekennzeichnet, dass, wenn ein Vergleich zwischen den eingewebten Garnen, die an der Vorderseite des Stoffs freiliegend sind, vorgenommen wird, die Einheitsbereiche einen Einheitsbereich (Zc) beinhalten, in dem die eingewebten Garne, die an der Vorderseite des Stoffes freiliegend sind, aus nur der ersten Faser (9n) bestehen, und einen Einheitsbereich (Ze), in dem die eingewebten

Garne, die an der Vorderseite des Stoffes freiliegend sind, aus nur der zweiten Faser (9c) bestehen.

4. Spitzenstoff nach Anspruch 1 oder 2,
dadurch gekennzeichnet, dass der Spitzenstoff ein Leavers-Spitzenstoff ist, die Schussfäden vorderseitige Kettfäden (FW) und rückseitige Kettfäden (BW) beinhalten, und die eingewebten Garne Gimp-Garne (8), erste Einlagegarne (9n) der ersten Faser und zweite Einlagegarne (9c) der zweiten Faser beinhalten.

5. Verfahren zum Wirken eines Spitzenstoffs (1), der mit einem Grundgewebe (4), bestehend aus Maschenstäbchen (W) und Schussfäden (BW, FW), die mit den Maschenstäbchen verwoben sind, und eingewebten Garnen (9), die in das Grundgewebe eingewebt sind, gewirkt ist,

wobei die eingewebten Garne aus Garnen aus unterschiedlichen Faserarten gebildet sind, die mindestens eine erste Faser (9n) und eine zweite Faser (9c) beinhalten,
wobei das Verfahren umfasst:

Versehen eines Spitzenstoffes in einer Breitenrichtung (D1) mit Teilen (2n oder 2c), bei denen eingewebte Garne derselben Faserart durch denselben Lauf über mehrere Maschenstäbchen laufen,
Verbinden der Teile (2n oder 2c) in einer Wirkrichtung (D2) des Spitzenstoffs mit Teilen (2c oder 2n), bei denen eingewebte Garne von unterschiedlicher Faserart durch denselben Lauf über mehrere Maschenstäbchen laufen,
dadurch gekennzeichnet, dass die mindestens erste Faser und zweite Faser so ausgewählt werden, dass sie unterschiedliche Farbstoffaffinitäten in Bezug auf einen spezifischen Farbstoff aufweisen,
eine Abstufungspitze, die in Bezug auf Einheitsbereiche (Zc, Zm1, Zm2, Ze) gebildet wird, die in der Breitenrichtung (D1) des Spitzenstoffs angeordnet sind und die jeweils aus einer vorbestimmten Anzahl an Läufen bestehen, und
wenn ein Vergleich zwischen den eingewebten Garnen, die an der Vorderseite des Stoffs freiliegend sind, vorgenommen wird, ein abstufungsartiges Gewebe hergestellt wird, bei dem eine Dichte der ersten Faser (9n) in Bezug auf eine Dichte der zweiten Faser (9c) in einem Vergleich zwischen den Einheitsbereichen sequenziell in mindestens drei Stufen erhöht ist.

6. Verfahren zum Wirken eines Spitzenstoffs nach Anspruch 5, **dadurch gekennzeichnet, dass** zur sequenziellen Erhöhung der Dichte der ersten Faser (9n) in Bezug auf die Dichte der zweiten Faser (9c) in dem Vergleich zwischen den Einheitsbereichen die Anzahl an Teilen (2n), bei denen Garne der ersten Faser durch denselben Lauf über mehrere Maschenstäbchen laufen, desto weiter erhöht wird, je größer die Dichte der ersten Faser in dem Bereich sein muss.

7. Verfahren zum Wirken eines Spitzenstoffs nach Anspruch 5 oder 6,
dadurch gekennzeichnet, dass, wenn ein Vergleich zwischen den eingewebten Garnen, die an der Vorderseite des Stoffs freiliegend sind, vorgenommen wird, die Einheitsbereiche einen Einheitsbereich (Zc) beinhalten, in dem eingewebte Garne, die an der Vorderseite des Stoffes freiliegend sind, aus nur der ersten Faser (9n) bestehen, und einen Einheitsbereich (Ze), in dem eigewebte Garne, die an der Vorderseite des Stoffes freiliegend sind, aus nur der zweiten Faser (9c) bestehen.

8. Verfahren zum Wirken eines Spitzenstoffs nach Anspruch 5 oder 6,
dadurch gekennzeichnet, dass der Spitzenstoff ein Leavers-Spitzenstoff ist, die Schussfäden vorderseitige Kettfäden (FW) und rückseitige Kettfäden (BW) beinhalten, und die eingewebten Garne Gimp-Garne (8), erste Einlagegarne (9n) der ersten Faser und zweite Einlagegarne (9c) der zweiten Faser beinhalten.

Revendications

1. Etoffe en dentelle (1) qui est tricotée avec une armure de base (4) composée de colonnes de mailles (W) et de trames (BW, FW), qui sont entrelacées avec les colonnes de mailles, et des fils d'entrelacement (9) qui sont entrelacés dans l'armure de base,

dans laquelle les fils d'entrelacement sont configurés en fils de différents types de fibre qui comprennent au moins une première fibre (9n) et une deuxième fibre (9c),
dans laquelle l'étoffe en dentelle est dotée, dans la direction de la largeur (D1), de parties (2n ou 2c) dans lesquelles des fils d'entrelacement du même type de fibre passent à travers la même rangée de mailles sur une pluralité de colonnes de mailles (W), adjacentes dans la direction de tricotage (D2) de l'étoffe en dentelle à des parties (2c ou 2n) dans lesquelles des fils d'entrelacement de types de fibre différents passent à travers la même rangée de mailles sur une pluralité de colonnes de mailles,
caractérisée en ce que les au moins première

fibre et deuxième fibre ont des affinités de teinture différentes pour un colorant spécifique, et l'étoffe en dentelle est une dentelle en dégradé dans laquelle, en ce qui concerne des zones unitaires (Zc, Zm1, Zm2, Ze) qui sont disposées dans la direction de la largeur (D1) de l'étoffe en dentelle et qui sont composées chacune d'un nombre prédéterminé de rangées de mailles, et lorsqu'une comparaison est effectuée entre les fils d'entrelacement exposés sur le côté avant de l'étoffe, une dentelle du type en dégradé dans laquelle la densité de la première fibre (9n) est augmentée en séquence en au moins trois stades par rapport à la densité de la deuxième fibre (9c) dans une comparaison entre les zones unitaires est produite.

2. Etoffe en dentelle selon la revendication 1, **caractérisée en ce qu'**afin d'augmenter en séquence la densité de la première fibre (9n) par rapport à la densité de la deuxième fibre (9c) dans la comparaison entre les zones unitaires, le nombre des parties (2n) dans lesquelles des fils de la première fibre passent à travers la même rangée de mailles sur une pluralité de colonnes de mailles est d'autant plus augmenté que la densité de la première fibre dans la zone doit être importante.

3. Etoffe en dentelle selon la revendication 1 ou 2, **caractérisée en ce que**, lorsqu'une comparaison est effectuée entre les fils d'entrelacement exposés sur le côté avant de l'étoffe, les zones unitaires comprennent une zone unitaire (Zc) dans laquelle les fils d'entrelacement exposés sur le côté avant de l'étoffe sont composés uniquement de la première fibre (9n), et une zone unitaire (Ze) dans laquelle les fils d'entrelacement exposés sur le côté avant de l'étoffe sont composés uniquement de la deuxième fibre (9c).

4. Etoffe en dentelle selon la revendication 1 ou 2, **caractérisée en ce que** l'étoffe en dentelle est une étoffe en dentelle de Calais, les trames comprennent des chaînes avant (FW) et des chaînes arrière (BW), les fils d'entrelacement comprennent des fils de guimpe (8), des premiers fils de garniture (9n) de la première fibre et des deuxièmes fils de garniture (9c) de la deuxième fibre.

5. Procédé de tricotage d'une étoffe en dentelle (1) qui est tricotée avec une armure de base (4) composée de colonnes de mailles (W) et de trames (BW, FW), qui sont entrelacées avec les colonnes de mailles, et des fils d'entrelacement (9) qui sont entrelacés dans l'armure de base,

dans lequel les fils d'entrelacement sont configurés en fils de différents types de fibre qui comprennent au moins une première fibre (9n) et une deuxième fibre (9c),
le procédé comprenant :

le fait de doter une étoffe en dentelle, dans la direction de la largeur (D1), de parties (2n ou 2c) dans lesquelles des fils d'entrelacement du même type de fibre passent à travers la même rangée de mailles sur une pluralité de colonnes de mailles ;
le fait de rendre adjacentes les parties (2n ou 2c) dans la direction de tricotage (D2) de l'étoffe en dentelle à des parties (2c ou 2n) dans lesquelles des fils d'entrelacement de types de fibre différents passent à travers la même rangée de mailles sur une pluralité de colonnes de mailles ;
caractérisé par la sélection des au moins première fibre et deuxième fibre pour qu'elles aient des affinités de teinture différentes pour un colorant spécifique,
la formation d'une dentelle en dégradé ayant, en ce qui concerne des zones unitaires (Zc, Zm1, Zm2, Ze) qui sont disposées dans la direction de la largeur (D1) de l'étoffe en dentelle et qui sont composées chacune d'un nombre prédéterminé de rangées de mailles ; et lorsqu'une comparaison est effectuée entre les fils d'entrelacement exposés sur le côté avant de l'étoffe, une dentelle du type en dégradé dans laquelle la densité de la première fibre (9n) est augmentée en séquence en au moins trois stades par rapport à la densité de la deuxième fibre (9c) dans une comparaison entre les zones unitaires.

6. Procédé de tricotage d'une étoffe en dentelle selon la revendication 5, **caractérisé en ce qu'**afin d'augmenter en séquence la densité de la première fibre (9n) par rapport à la densité de la deuxième fibre (9c) dans la comparaison entre les zones unitaires, le nombre des parties (2n) dans lesquelles des fils de la première fibre passent à travers la même rangée de mailles sur une pluralité de colonnes de mailles est d'autant plus augmenté que la densité de la première fibre dans la zone doit être importante.

7. Procédé de tricotage d'une étoffe en dentelle selon la revendication 5 ou 6, **caractérisé en ce que**, lorsqu'une comparaison est effectuée entre les fils d'entrelacement exposés sur le côté avant de l'étoffe, les zones unitaires comprennent une zone unitaire (Zc) dans laquelle les fils d'entrelacement exposés sur le côté avant de l'étoffe sont composés uniquement de la première fibre (9n), et une zone unitaire (Ze) dans laquelle les fils d'entrelacement exposés sur le côté avant de l'étoffe sont composés uniquement de la deuxième fibre (9c).

8. Procédé de tricotage d'une étoffe en dentelle selon la revendication 5 ou 6, **caractérisé en ce que** l'étoffe en dentelle est une étoffe en dentelle de Calais, les trames comprennent des chaînes avant (FW) et des chaînes arrière (BW), les fils d'entrelacement comprennent des fils de guimpe (8), des premiers fils de garniture (9n) de la première fibre et des deuxièmes fils de garniture (9c) de la deuxième fibre.

FIG. 1A

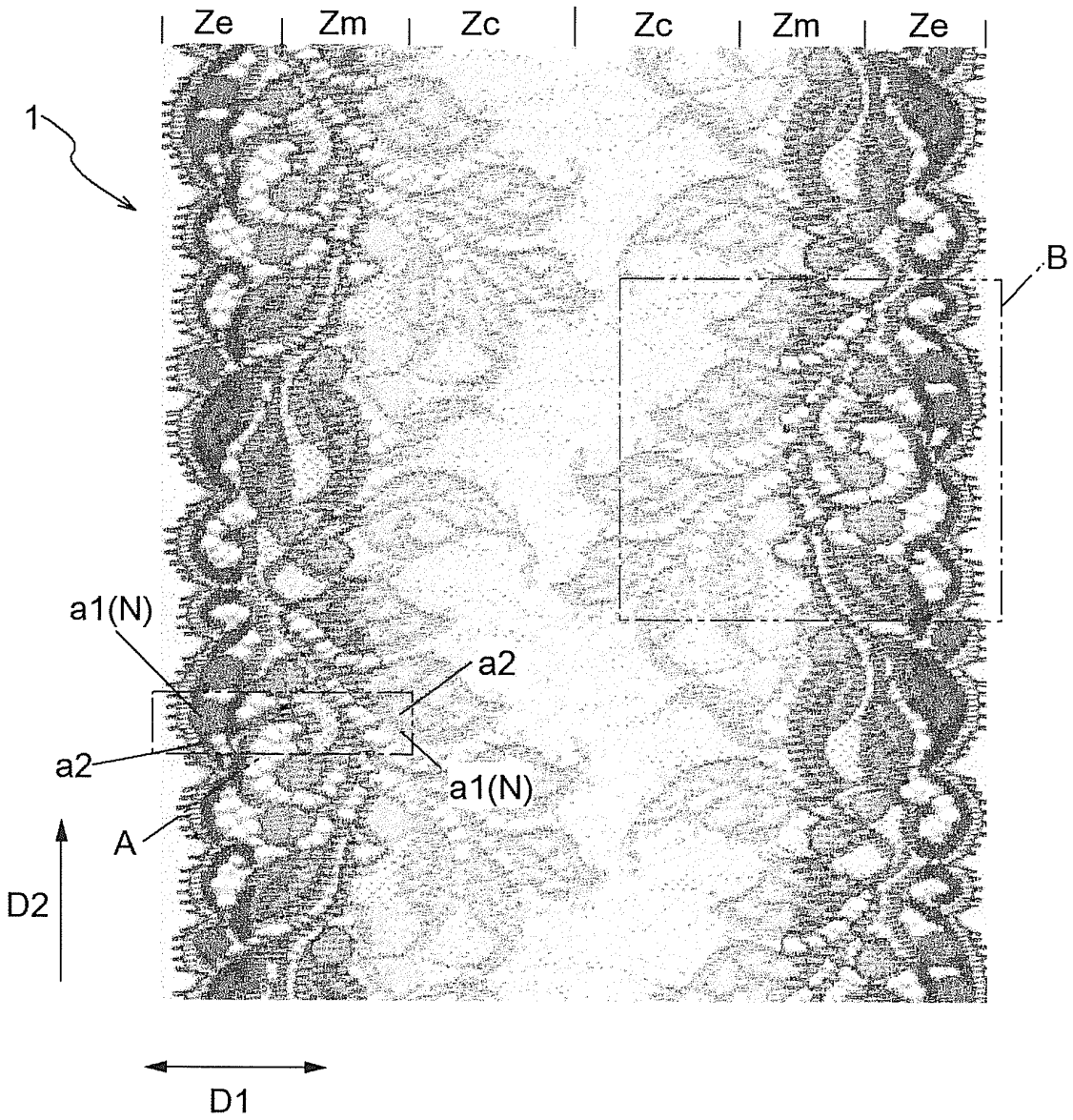

Ze
Zm
Zc
Zc
Zm
Ze
1
B
a1(N)
a2
a2
a1(N)
A
D2
D1

FIG. 1B

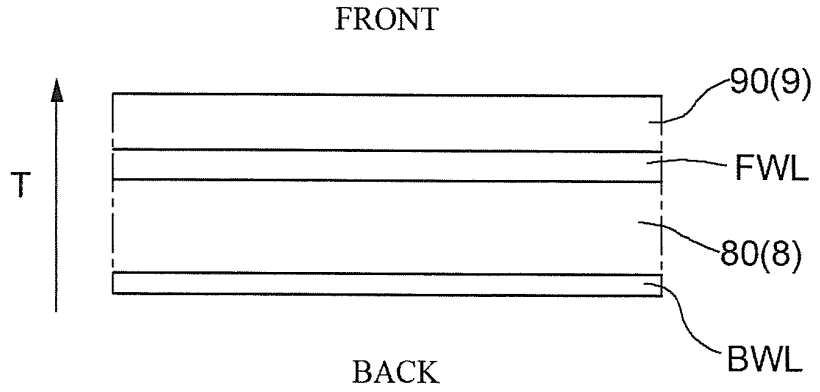

FRONT
90(9)
T
FWL
80(8)
BWL
BACK

FIG. 2A

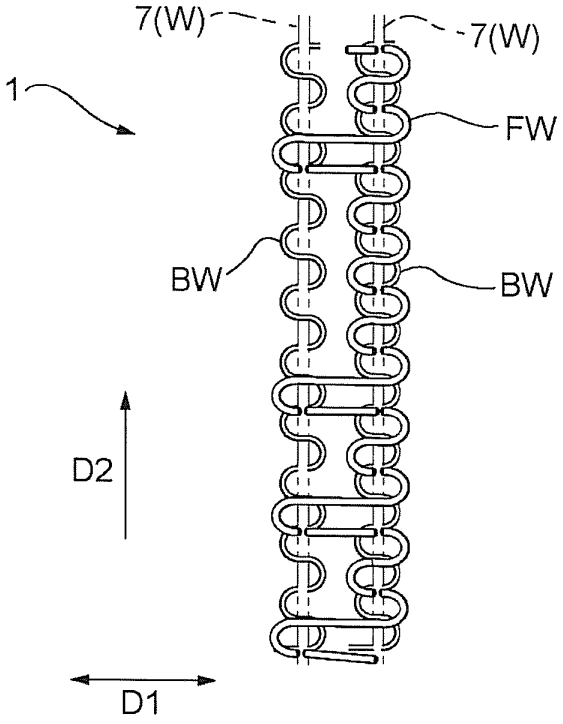


FIG. 2B

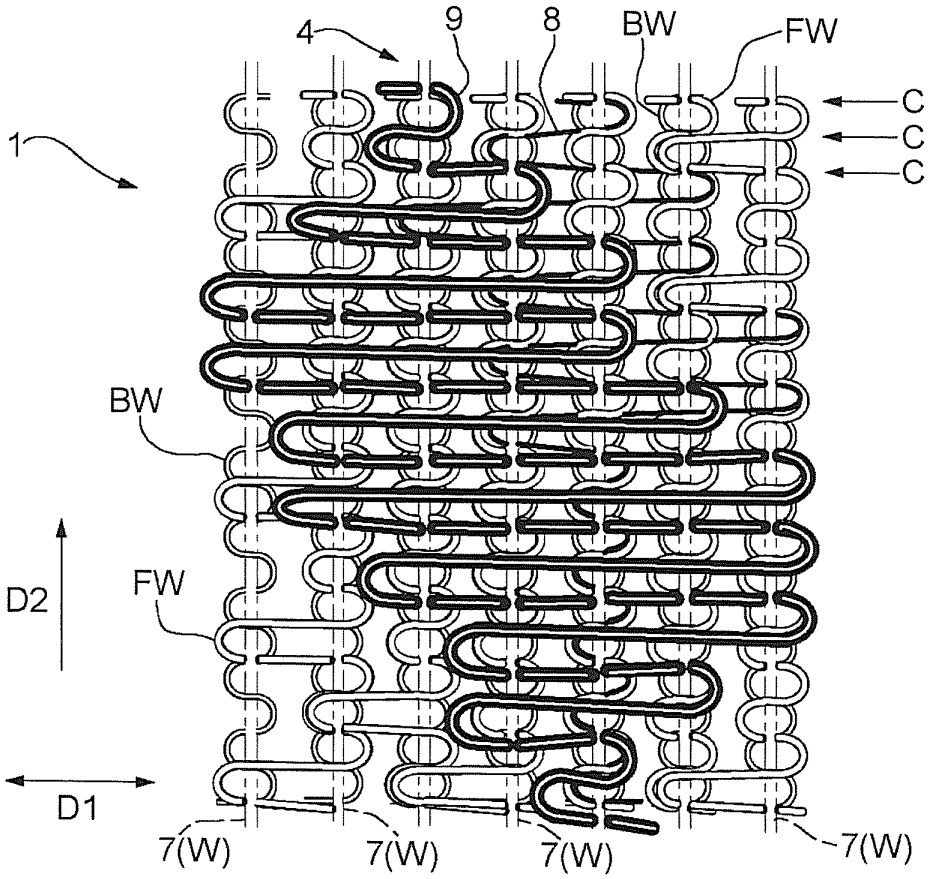


FIG. 3A

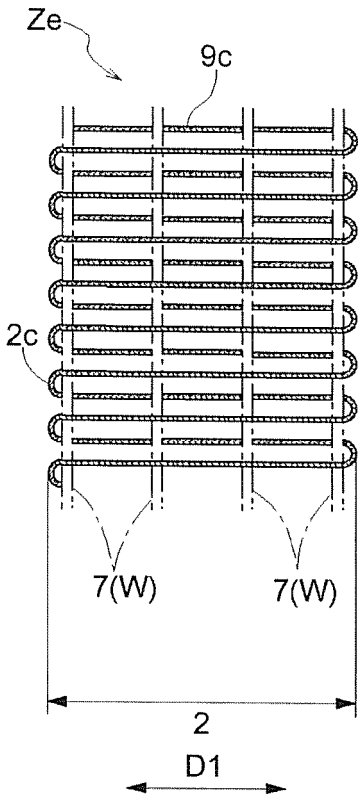


FIG. 3B

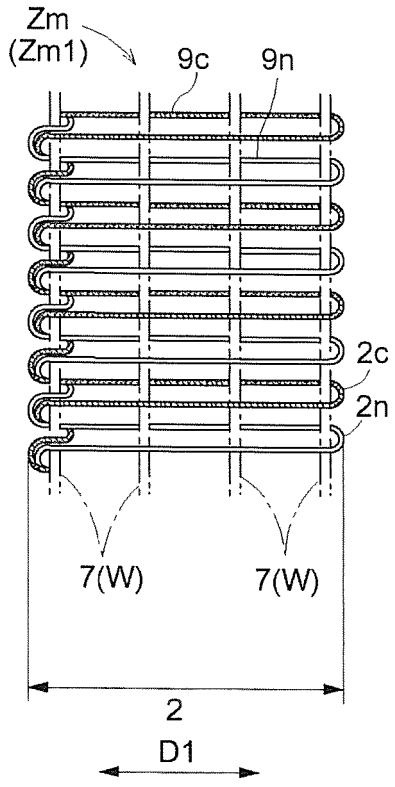


FIG. 3C

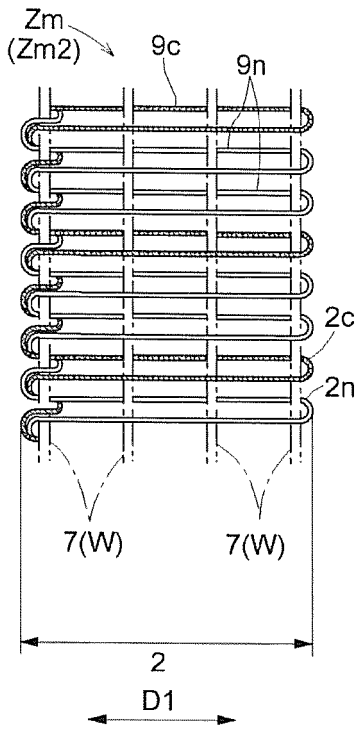


FIG. 3D

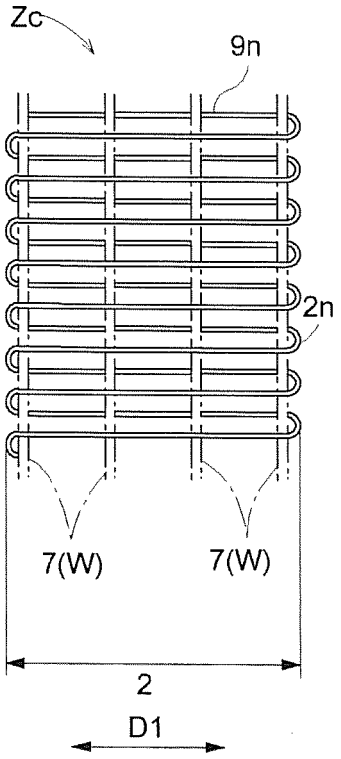


FIG. 4

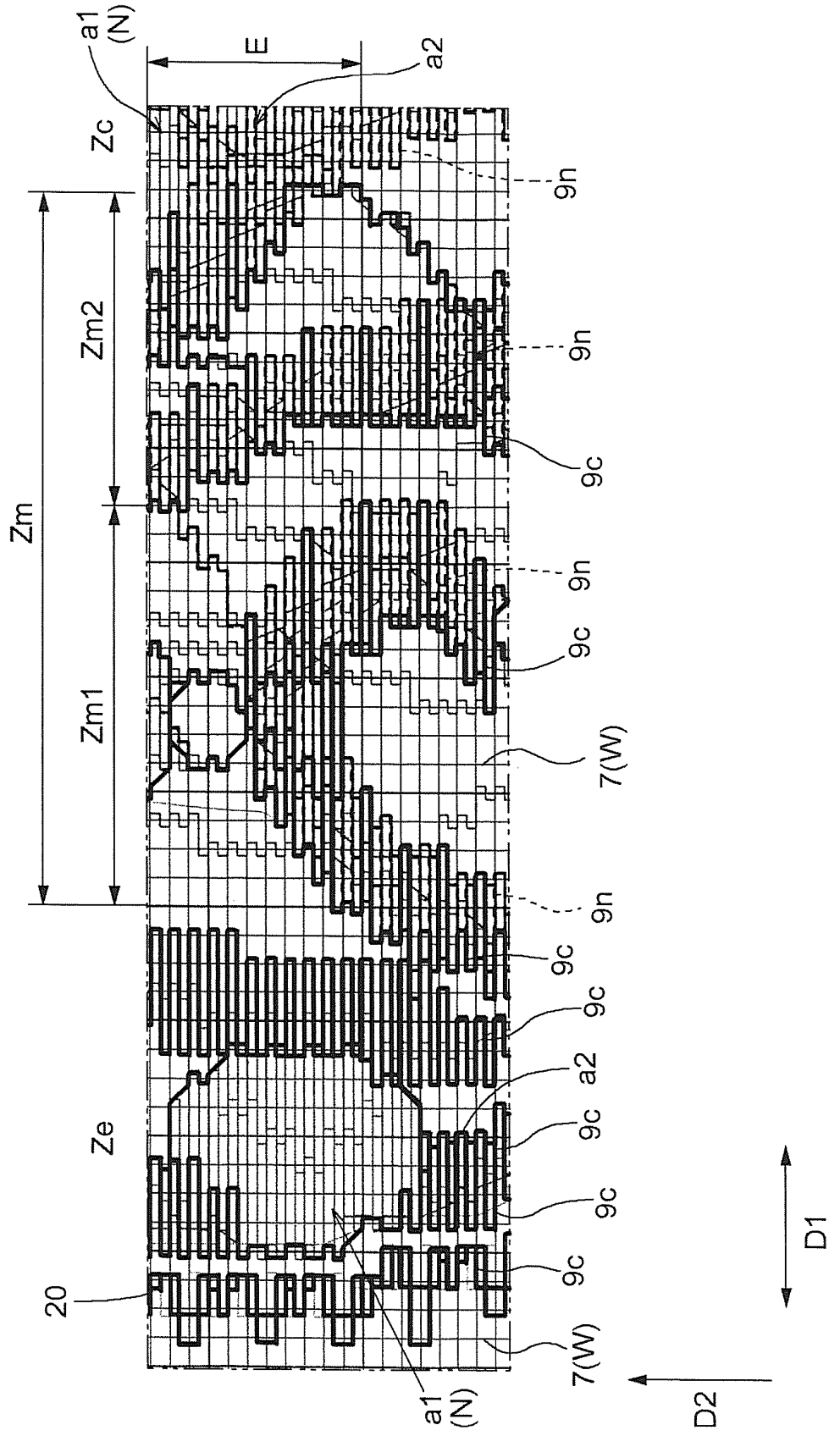

a1
(N)
E
a2
Zc
9n
9n
9c
Zm2
Zm
9n
9c
Zm1
7(W)
9n
9c
9c
a2
Ze
9c
9c
9c
20
7(W)
a1
(N)
D1
D2

FIG. 5

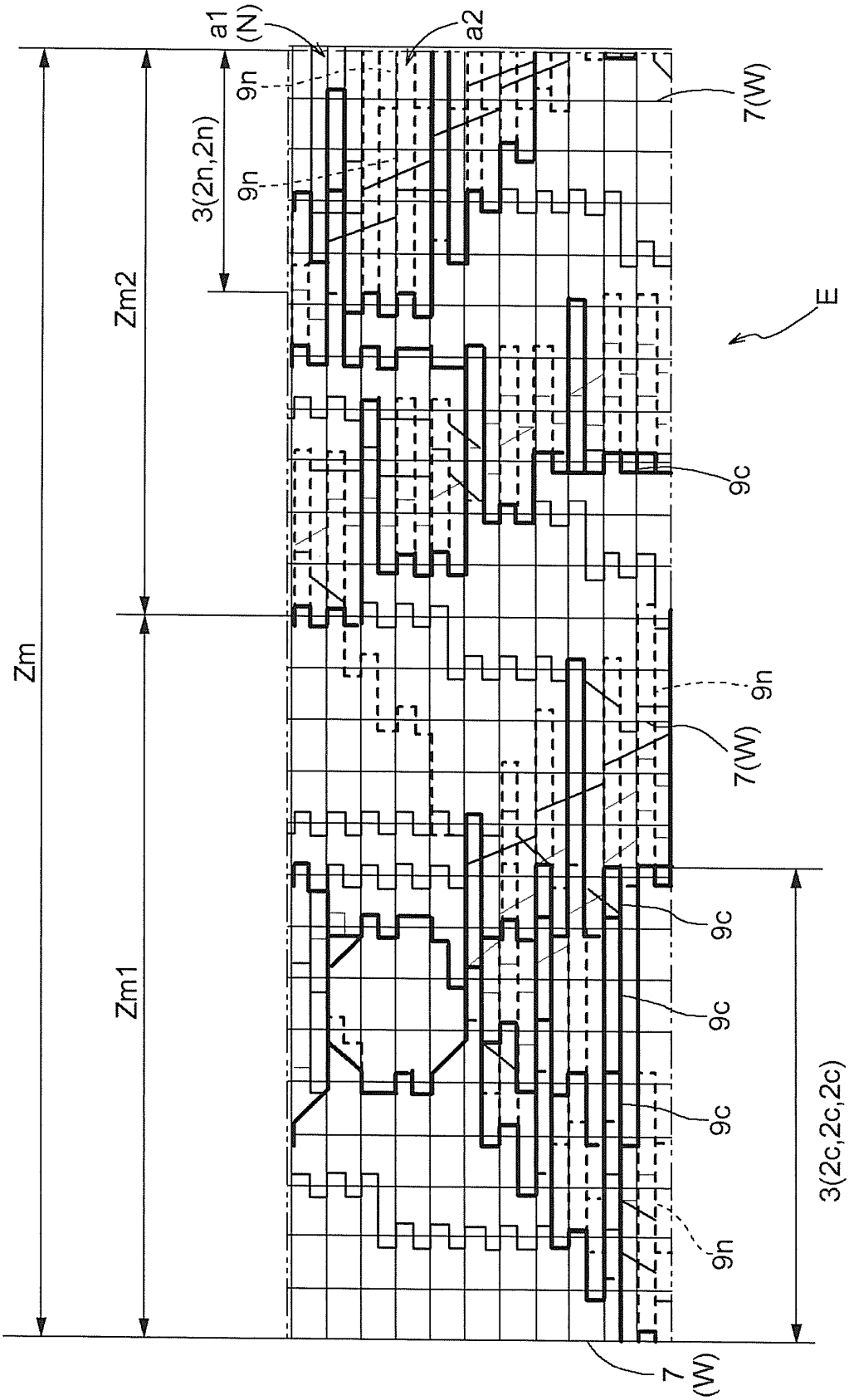


FIG. 6

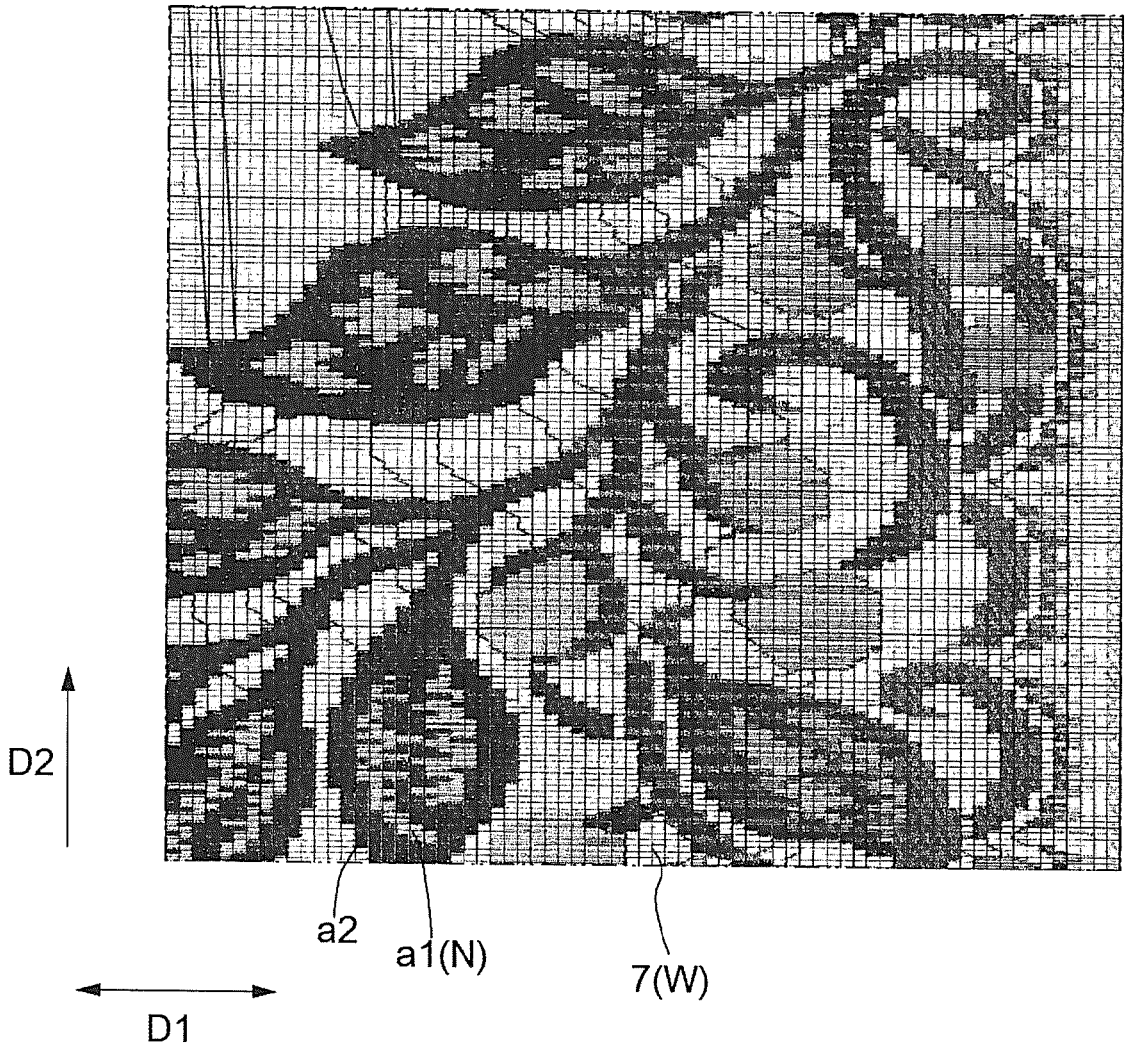


FIG. 7A

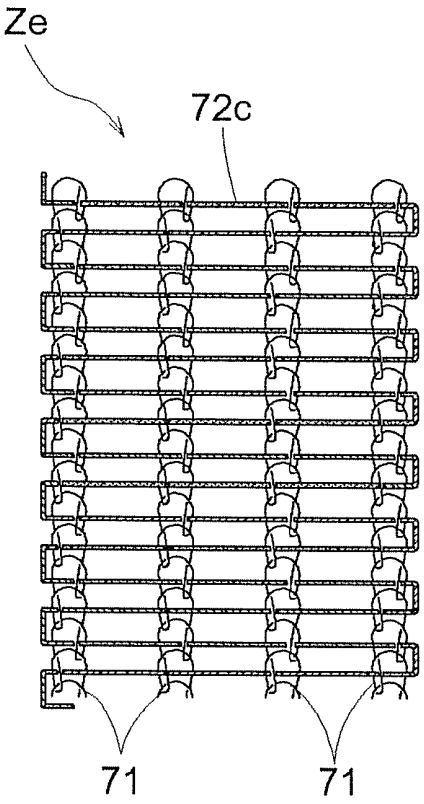


FIG. 7B

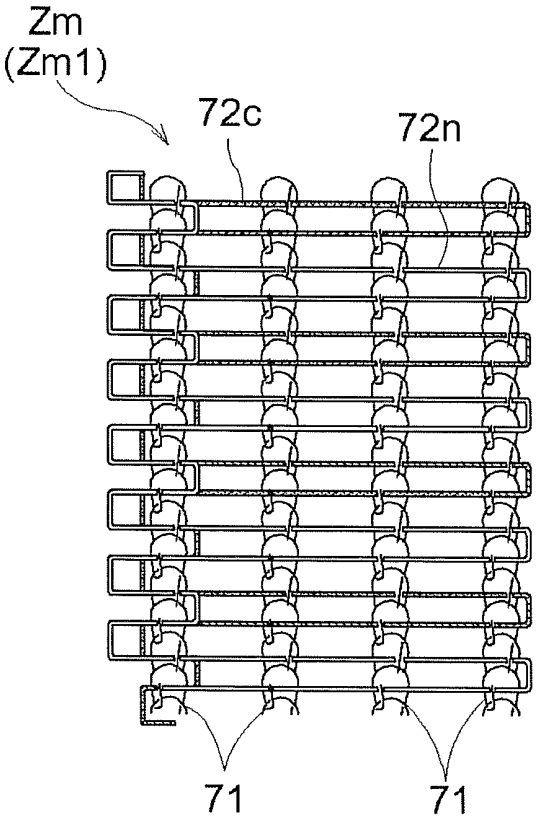


FIG. 7C

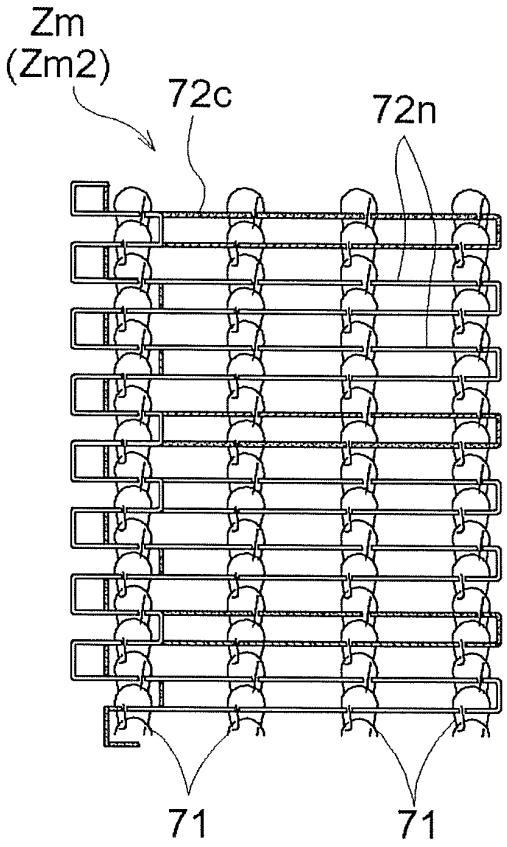
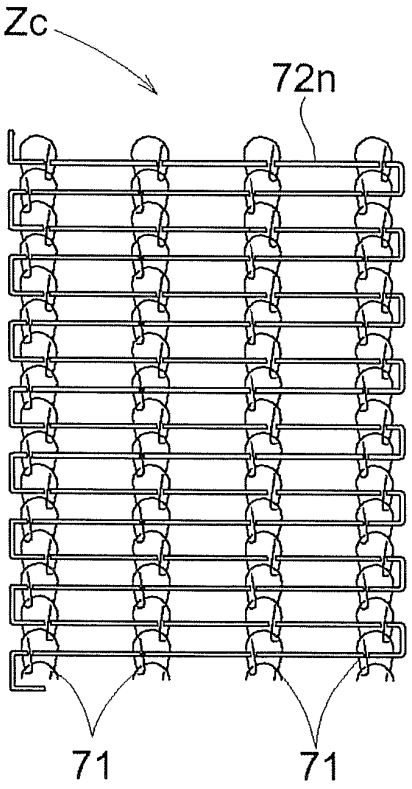


FIG. 7D



REFERENCES CITED IN THE DESCRIPTION

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