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(54) **Woven or knitted ribbon comprising transparent yarns**

(57) Transparent or semi-transparent yarns and dyed yarns are used in combination as composition yarns of a ribbon or belt to be woven or knitted. Consequently, color of the dyed yarns can be seen through the transparent yarns at intersections of both yarns. Further,

the belt having a specific color tone produced by mixing various colors may be obtained. If it is intended to change the color of the belt, the belt having a desired color can be produced easily only by changing part of the composition yarns.

FIG. 1

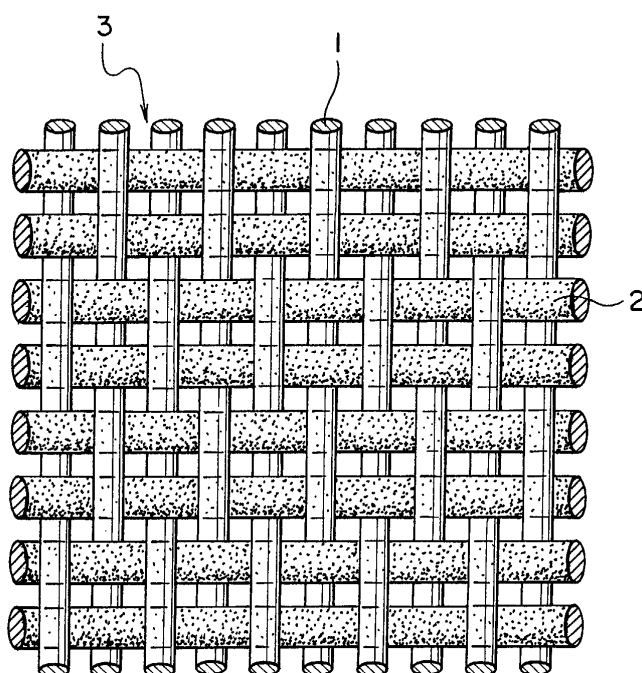
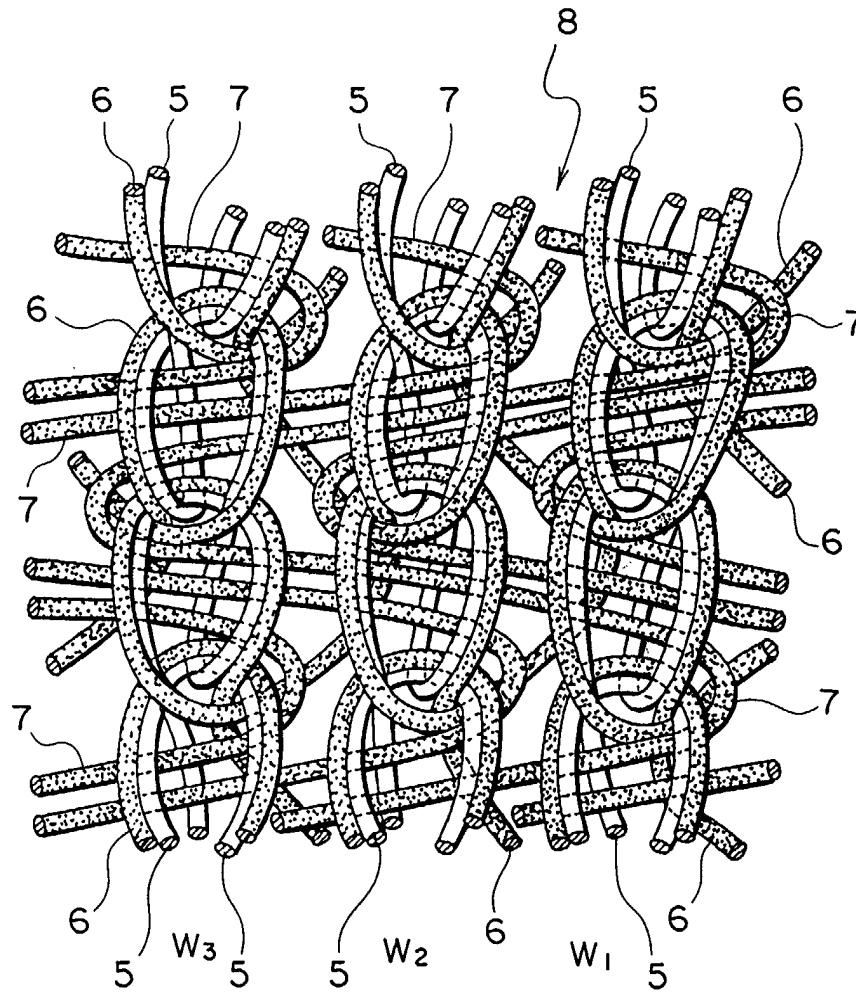


FIG. 3



Description

BACKGROUND OF THE INVENTION

1. Field of the Invention

[0001] The present invention relates to a belt used for various kinds of articles such as a slide fastener tape, a pull of a slider for a slide fastener, a strap of a portable phone or a camera, a bag strap, a shoulder belt and a tightening belt.

2. Description of the Related Art

[0002] In recent years, with acceleration of fashionable trend of clothes and the like, customers have demanded for belts having diversified colors for use in these clothes and the like. For the reason, small quantity of various belts should be prepared. However, because a large number of belts are dyed in a single color all at once conventionally, such a conventional belt is not suitable for dying in diversified colors each with a small quantity so as to generate a large number of belts of stock.

[0003] Further, according to a conventional way, in order to obtain a large number of various kinds of dyed belts in a small quantity each, warp yarns and weft yarns or warp knitting yarns dyed respectively in a predetermined color preliminarily are prepared and then supplied to a loom or a knitting machine so as to weave or knit various patterns. If it is intended to change color of the belt, the operation of the loom or the knitting machine is stopped and the yarns are replaced. Then, the operation is restarted to weave or knit. However, according to this method, when it is intended to change color of the belt, all yarns supplied to the loom or the knitting machine must be removed and replaced with yarns of other color. Thus, it takes a long time to carry out such replacement, thereby leading to suppression of productivity.

SUMMARY OF THE INVENTION

[0004] Accordingly, the present invention has been achieved in views of the above described problems and therefore, an object of the invention is to provide a belt woven by using transparent or semi-transparent yarns for any one of warp yarns and weft yarns while using dyed yarns for the other yarns, or a belt knitted by using transparent or semi-transparent yarns for part of plural warp knitting yarns while using dyed yarns for the other warp knitting yarns. Consequently, the color of the belt can be changed by replacing only the dyed yarns without replacing all the yarns supplied to the loom or knitting machine thereby reducing time and labor for a replacement of yarns.

[0005] More specifically, a beautifully colored belt is provided by using transparent yarns for yarns to be dis-

posed longitudinally while using dyed yarns for yarns to be disposed laterally or by using the transparent yarns for the yarns to be disposed laterally while using the dyed yarns for the yarns to be disposed longitudinally.

[0006] Further, by specifying the colors of the warp yarns and the weft yarns or warp knitting yarns to be disposed in respective whales and weft knitting yarns to be disposed between respective whales, for example, using dyed transparent yarns for ones while using ordinary dyed yarns for the other ones such that the both colors are different, a belt having a beautiful color tone can be provided with a simple structure.

[0007] By intersecting transparent yarns with dyed yarns in a belt composed of a woven fabric or a warp knitted fabric, the color of the dyed yarns appears beautifully at those intersections. If dyed transparent yarns are employed instead of the transparent yarns, the colors of both of the yarns are mixed at the intersection with the dyed yarn, so that a beautifully colored belt is provided.

[0008] Further, by specifying the configuration of the weft yarns for use in a belt or warp knitting yarns to be disposed between respective whales, for example, using modified cross-section yarns having various cross sections for the weft yarns or the warp knitting yarns, a beautiful glossy belt having a special texture can be provided.

[0009] Furthermore, by specifying the structure of the warp yarns or the warp knitting yarns to be disposed in respective whales and the weft yarns or the warp knitting yarns to be disposed between the respective whales for use in a belt formed of woven fabric or warp knitted fabric, for example, using mono-filament for the warp yarns or the warp knitting yarns to be disposed in respective whales and using multi-filament for the weft yarns or the warp knitting yarns to be disposed between the respective whales, a belt having flexibility can be provided.

[0010] Further, by specifying the arrangement of the warp yarns in a belt formed of woven fabric, for example, forming a space portion between warp yarn groups each in which several dyed or transparent warp yarns are approached, such that striped pattern is produced with existence of dense and sparse regions of the warp yarns, the weft yarns are exposed in that space portion. Consequently, if transparent yarns or dyed yarns are used as the weft yarns, a beautiful belt with brilliant pinstriped patterns is provided.

[0011] And further, by specifying the thickness of composition yarns of a belt formed of woven fabric or warp knitted fabric, for example, using a thinner transparent yarns than the weft yarns or the warp knitting yarns to be disposed between respective whales as the warp yarns or the warp knitting yarns to be disposed in respective whales, the color possessed by the weft yarns or the warp knitting yarns to be disposed between the respective whales appears clearly on a surface of the fabric. Thus, a belt having a special texture and a beautiful color tone is produced easily.

BRIEF DESCRIPTION OF THE DRAWINGS

[0012]

Fig. 1 is a partial enlarged front view of a woven belt.
Fig. 2 is a partial enlarged front view of a mock leno woven belt.

Fig. 3 is a partial enlarged front view of a knitted belt.

Fig. 4 is a warp knitting structure diagram of the same belt.

Fig. 5 is a structure diagram of each of knitting yarns in the same belt.

Fig. 6 is a front view of a slide fastener employing a belt.

Fig. 7 is a perspective view of a pull of a slider for a slide fastener employing a belt.

Fig. 8 is a perspective view of a strap of a portable phone employing a belt.

DESCRIPTION OF ILLUSTRATIVE EMBODIMENTS

[0013] Hereinafter, various embodiments of a belt of this invention will be described in detail with reference to the accompanying drawings.

[0014] The belt of the invention is available as a slide fastener tape as shown in Fig. 6, a pull of a slider for a slide fastener as shown in Fig. 7, and a strap for a portable phone or a camera as shown in Fig. 8. Further, the belt may be used as a bag strap, a shoulder belt, a tightening belt and the like. Ordinarily, this kind of belt is woven by inserting double-pick weft yarns into arranged warp yarns with a needle. Several embodiments of the belt of the invention will be described below.

(First embodiment)

[0015] A first embodiment of a belt of a woven fabric shown in Fig. 1 will be described. Nylon yarn formed of nylon mono-filament is employed for a warp yarn 1 of the belt. This nylon yarn 1 is a colorless transparent or semi-transparent yarn, or a transparent or semi-transparent yarn colored in an arbitrary color. On the other hand, a polyester yarn formed of polyester multi-filament is employed for a weft yarn 2. This polyester yarn is dyed in an arbitrary color preliminarily or after weaving and woven into the belt with plain weaving structure.

[0016] In the woven belt, color of polyester yarns can be seen through nylon yarns at intersections of the polyester yarns formed of dyed multi-filament and colorless transparent or semi-transparent nylon yarns formed of mono-filament so as to achieve beautiful intersections. If dyed transparent or semi-transparent nylon yarns are used, colors of the polyester yarns 2 and nylon yarns are mixed at the intersections so as to produce unique color thereby finishing a belt having a beautiful color tone.

(Second embodiment)

[0017] A second embodiment of the woven belt shown in Fig. 1 will be described below. Polyester yarn formed of synthetic fiber multi-filament is employed for a warp yarn 1 of the belt. This polyester yarn is dyed in an arbitrary color preliminarily or after weaving. Nylon yarn formed of synthetic fiber mono-filament is employed for a weft yarn 2. If the nylon yarn is colorless transparent, semi-transparent or dyed transparent, unique color is produced at a intersection of the warp yarn 1 and the weft yarn 2 of a woven fabric 3 like the first embodiment, so that a belt having a beautiful color tone can be obtained.

[0018] Meanwhile, the warp yarn 1 may be made of synthetic fiber mono-filament and the weft yarn 2 may be made of synthetic fiber multi-filament. Further, the warp yarn 1 and the weft yarn 2 may be synthetic fiber yarns each having the same structure or different structure.

(Third embodiment)

[0019] A third embodiment of the woven belt shown in Fig. 1 will be described below. Warp yarns 1 of the belt is polyester yarns formed of polyester mono-filament. The polyester yarns are colorless transparent or semi-transparent yarns or transparent or semi-transparent yarns dyed in an arbitrary color preliminarily or after weaving. As weft yarns 2, rayon yarns formed of reproduced fiber multi-filament are employed. The rayon yarns are dyed in an arbitrary color preliminarily or after weaving. In the woven belt, color of the rayon yarns can be seen through the polyester yarns at intersections of the dyed rayon yarns formed of multi-filament and colorless transparent or semi-transparent polyester yarns formed of mono-filament thereby providing the beautiful intersections. If dyed transparent or semi-transparent polyester yarns are employed, the color of the rayon yarns can be seen through the polyester yarns at the intersections, so that color of the rayon yarns and color of the polyester yarns are mixed thereby producing a unique color, so that a belt having a beautiful color tone is finished.

(Fourth embodiment)

[0020] A fourth embodiment of the woven belt shown in Fig. 1 will be described. According to this embodiment, nylon yarns formed of nylon mono-filament are used as warp yarns of the belt. The nylon yarns are formed of the nylon yarns dyed in an arbitrary color preliminarily or after weaving and being transparent, that is, dyed transparent nylon yarns. As weft yarns 2, polyester yarns of synthetic fiber are employed. The polyester yarns are modified cross-section yarns having a modified cross-section and dyed preliminarily or after weaving. Alternately, the polyester yarns may be color-

less. According to this embodiment, by weaving the modified cross-section yarns into the belt, woven fabric may contain beautiful gloss thereon, so that the belt having a specific texture and color tone can be finished.

(Fifth embodiment)

[0021] A fifth embodiment of the woven belt shown in Fig. 1 will be described. According to this embodiment, the thickness of each of warp yarns 1 and weft yarns 2 for use in the belt is specified. The warp yarns are formed of synthetic fiber mono-filament and the thickness of the mono-filament is 97 deci-tex. As the weft yarn 2, yarns formed of synthetic fiber multi-filament having the thickness of 113 or 200 deci-tex are employed. Because the weft yarns 2 are thicker than the warp yarns 1 in this belt, the weft yarns 2 are extended straight and the warp yarns 1 stride over them. Then, this pattern is repeated, so that wave lines of the warp yarns 1 are produced beautifully and plasticity is added in the belt, thereby providing a belt easy to use. Meanwhile, the thickness of the warp yarns 1 can be selected in a range of 50 to 500 deci-tex.

(Sixth embodiment)

[0022] A sixth embodiment of a woven belt shown in Fig. 2 will be described. The warp yarns 1 of this belt is formed of synthetic fiber mono-filament and the weft yarns 2 are formed of synthetic fiber multi-filament. The weft yarns 2 made of multi-filament are inserted with double pick and plural warp yarn groups, in each of which eight warp yarns 1 are approached as one unit, are arranged in the weft direction such that the respective groups are separated from each other. Then, space portions 4 are produced between the warp yarn groups to produce a belt formed of mock leno woven fabric, so that striped pattern is produced with existence of dense and sparse regions of the warp yarns.

[0023] In this belt, the eight warp yarns 1 are approached so as to form a dense weaving pattern and the space portions 4 existing between these warp yarn groups make the weft yarns 2 appear clearly. Therefore, if the mono-filament of the warp yarns 1 is dyed and transparent while colorless modified cross-section yarns are used as the weft yarns 2, color of the warp yarns 1 are stressed at intersections and glossy weft yarns 2 are stressed at the space portions 4, so that a beautiful pinstriped pattern is exposed entirely in the belt.

(Seventh embodiment)

[0024] A belt formed of a warp knitted fabric shown in Figs. 3 to 5 will be described. As shown in Figs. 3 and 4, warp knitting yarns 5, 6, 7 used in the warp knitted fabric 8 of this belt are knitted such that chain knitting yarns 5 of 0-1/1-0 are disposed in all whales of the warp

knitted fabric 8, tricot knitting yarns 6 of closed loop of 1-2/1-0 are entangled and knitted with the chain knitting yarns 5 and further, weft in-laid yarns 7 of 0-0/3-3 are knitted in, thereby knitting the belt.

[0025] As shown in Fig. 3, synthetic fiber mono-filament is employed for the chain knitting yarns 5 for use in this belt and as the mono-filament, colorless or dyed transparent yarns are used. Dyed synthetic fiber multi-filament is used as the tricot knitting yarns 6 of closed loop and the weft in-laid yarns 7. With this knitting structure, colors of the chain knitting yarn 5, the tricot knitting yarn 6 and the weft in-laid yarn 7 are mixed in each whale and at the same time, the colors of the tricot knitting yarn 6 and the weft in-laid yarn 7 appear between the whales. Consequently, a warp knitted belt having a beautiful color tone of a pinstriped pattern can be obtained.

[0026] Further, if in the warp knitted fabric 8 shown in Fig. 3, not only the chain knitting yarns 5 are formed of transparent yarns but also the tricot knitting yarns 6 disposed between respective whales are formed of the transparent yarns while only the weft in-laid yarns 7 employ dyed yarns, a warp knitted belt also having a beautiful color tone can be produced. Alternately, if the chain knitting yarns 5 are formed of the dyed yarns while the tricot knitting yarns 6 and the weft in-laid yarns 7 adopt colorless transparent yarns or modified cross-section yarns, warp knitted belt in which beautifully colored pinstriped pattern appears is obtained.

[0027] Meanwhile, two needle knitting yarns, single cord knitting yarns and warp in-laid yarns as well as the above described warp knitting yarns may be employed in the warp knitted fabric. Further, mono-filament may be used as the warp knitting yarns to be disposed in respective whales and multi-filament, which is thinner than the warp knitting yarns to be disposed in the respective whales, may be used as the warp knitting yarns to be disposed between respective whales, thereby providing flexibility in the belt. Further, modified cross-section yarns may be employed as the warp knitting yarns to be disposed between the respective whales so as to provide glossiness in the belt.

[0028] When yarns used in the belt of this invention, for example, the warp yarn 1 and the weft yarn 2 or several kinds of the warp yarns 5, 6, 7 are dyed in different colors, the colors of respective intersections are different.

Alternately, when the warp yarn 1 and the weft yarn 2 or several kinds of the warp yarns 5, 6, 7 are dyed in the same color, gradation is produced between the intersections and other portions. Further, a different in color is also produced depending upon the material and thickness of the yarns used in the belt.

[0029] Next, products using the belt will be described. Fig. 6 shows a slide fastener 10 and the belt is employed in a fastener tape 11. Fastener elements 12 are mounted on an edge portion of this tape 11 and the slide fastener is opened and closed by sliding a slider 13. Alter-

nately, as shown in Fig. 7, the belt is used as a pull 14 of the slider 13. The belt is attached to a connecting device 15 in a folded condition so as to form the pull 14. If the belt is employed for the fastener tape 11 and the pull 14, a beautifully colored slide fastener can be finished by combination of colors of the fastener tape 11 and the pull 14 of the slider 13. Fig. 8 shows a case where the belt is used for a strap 16 for a portable phone or a strap 16 for a camera.

[0030] As evident from the above descriptions, following effects are taken.

[0031] In the belt formed of a woven fabric woven by the warp yarns and the weft yarns or a warp knitted fabric knitted by plural warp knitting yarns, if the belt is woven or knitted with using transparent yarns as one of the yarns composing the belt and dyed yarns as the other one, color of the dyed yarn or mixed color appears at intersections of these yarns. As a result, a belt having a beautiful color tone can be produced with a simple structure. Further, in production of various kinds of dyed belts each in a small quantity, changing of the color of the belt can be achieved by only replacing the weft yarns. Thus, stock control is facilitated and productivity can be raised.

[0032] By employing transparent yarns or dyed yarns arbitrarily as the aforementioned warp yarns or the warp knitting yarns to be disposed in the respective whales, or the weft yarns or the weft knitting yarns to be disposed between the respective whales, a belt having a beautiful color tone can be achieved easily.

[0033] Further, if the modified cross-section yarns are employed as the weft yarns or the warp knitting yarns to be disposed between the respective whales when weaving or knitting, a beautiful color and a specific texture are attained and at the same time, a glossy belt can be produced easily. Additionally, if transparent yarns and dyed yarns are combined and synthetic fiber monofilament or multi-filament are used as respective composition yarns of the belt, there are such effects that not only a beautiful color is attained but also a plastic belt can be produced easily.

[0034] Furthermore, plural warp yarn groups, in which several warp yarns are approached with each other, are disposed such that they are spaced in the weft direction so as to produce space portions between the respective warp yarn groups, thereby forming a mock leno woven fabric. Consequently, striped pattern is produced with existence of dense and sparse regions of the warp yarns. Then, dyed yarns, transparent yarns or dyed transparent yarns are used for the warp yarns and the weft yarns arbitrarily. Consequently, a belt having a color tone of a beautiful pinstripe pattern is produced easily. Alternately, when yarns thinner than the weft yarns or warp knitting yarns to be disposed between the respective whales are employed as the warp yarns or the warp knitting yarns to be disposed in the respective whales, a beautifully colored belt having an excellent texture can be produced easily.

[Description of Reference Numerals]

[0035]

- | | | |
|----|---|----------------------|
| 5 | 1 | warp yarn |
| | 2 | weft yarn |
| | 3 | woven fabric |
| | 4 | space portion |
| | 5 | chain knitting yarn |
| 10 | 6 | tricot knitting yarn |
| | 7 | weft in-laid yarn |
| | 8 | warp knitted fabric |

15 Claims

- | | | |
|----|---|----|
| 1. | A belt composed of a woven fabric (3) or a warp knitted fabric (8), being characterized in that any one of yarns (1, 2, 5 to 6) constituting the woven fabric (3) or the warp knitted fabric (8) is dyed while the other yarns (1, 2, 5 to 6) are transparent yarns. | 20 |
| 2. | A belt according to claim 1, being characterized in that any one of the yarns intersecting each other is a transparent yarn while the other yarn is a dyed yarn, so that color of the dyed yarn appears or is seen through the other yarn at an intersection of the both yarns. | 25 |
| 3. | A belt according to claim 1 or 2, being characterized in that a yarn having transparency is dyed. | 30 |
| 4. | A belt according to claim 1 or 2, being characterized in that the belt is woven or knitted with the transparent yarn used for a warp yarn (1) or a warp knitting yarn (5) to be disposed in respective whales and the dyed yarn used for a weft yarn (2) or each of warp knitting yarns (6, 7) to be disposed between the respective whales. | 35 |
| 5. | A belt according to claim 1 or 2, being characterized in that a weft yarn (2) or each of warp knitting yarns (6, 7) to be disposed between respective whales is the transparent yarn while a warp yarn (1) or a warp knitting yarn (5) to be disposed in the respective whales is of dyed yarn. | 40 |
| 6. | A belt according to claim 1 or 2, being characterized in that the belt is woven or knitted with a warp yarn (1) and a weft yarn (2) or a warp knitting yarn (5) to be disposed in respective whales and weft knitting yarns (6, 7) to be disposed between respective whales each having different colors. | 45 |
| 7. | A belt according to claim 1 or 2, being characterized in that any one of a warp yarn (1) and a weft yarn (2) or any one of a warp knitting yarn (5) to be disposed in respective whales and each of weft knit- | 50 |
| | | 55 |

ting yarns (6, 7) to be disposed between respective
whales employs an modified cross-section yarn.

8. A belt according to claim 1 or 2, being **character-
ized in that** any one of a warp yarn (1) and a weft
yarn (2) or any one of a warp knitting yarn (5) to be
disposed in respective whales and each of weft knit-
ting yarns (6, 7) to be disposed between respective
whales is of synthetic fiber mono-filament while the
other one is of synthetic fiber multi-filament. 5 10
9. A belt according to claim 1 or 2, being **character-
ized in that** plural warp yarn groups in which sev-
eral warp yarns (1) are approached are spaced in
a weft direction and striped pattern is produced with
existence of dense and sparse regions of the warp
yarns, thereby forming the belt with a mock leno wo-
ven fabric. 15
10. A belt according to claim 1 or 2, being **character-
ized in that** the belt is woven or knitted such that a
warp yarn (1) or a warp knitting yarn (5) to be dis-
posed in respective whales is thinner than a weft
yarn (2) or warp knitting yarns (6, 7) to be disposed
between respective whales. 20 25

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FIG. 1

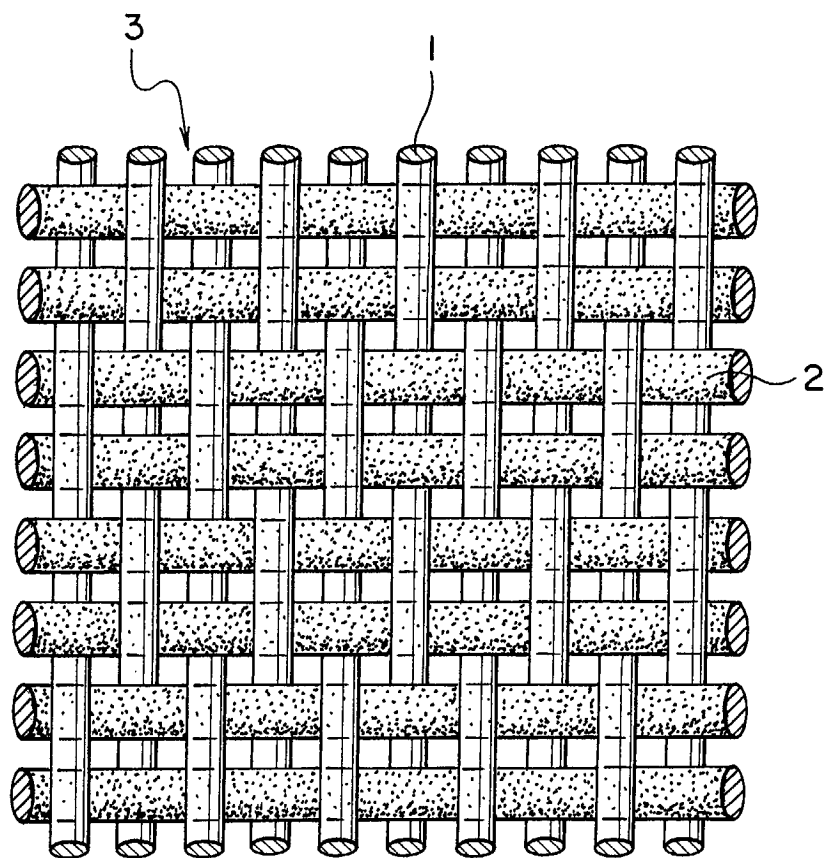


FIG. 2

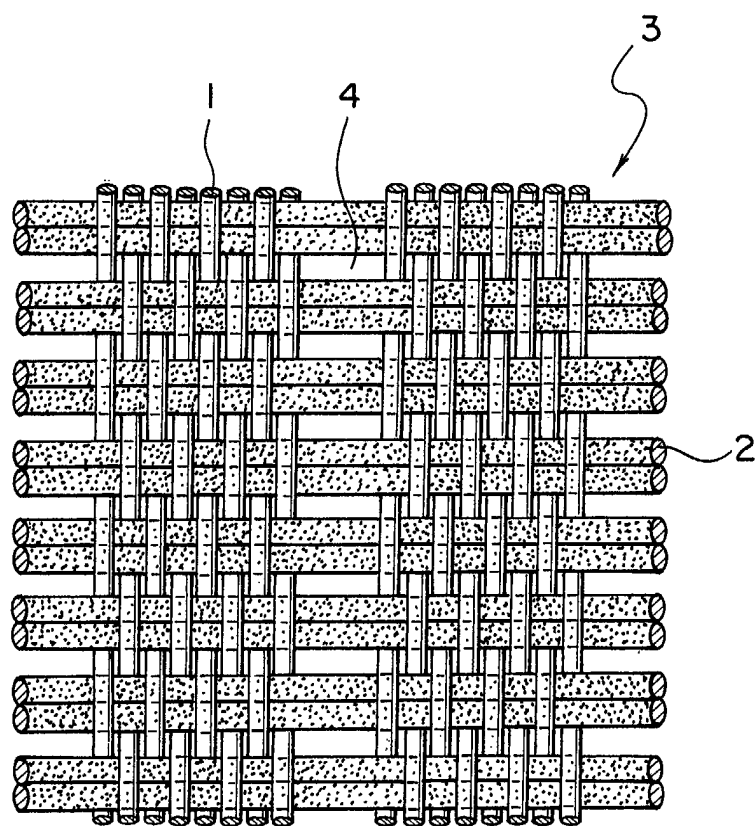


FIG. 3

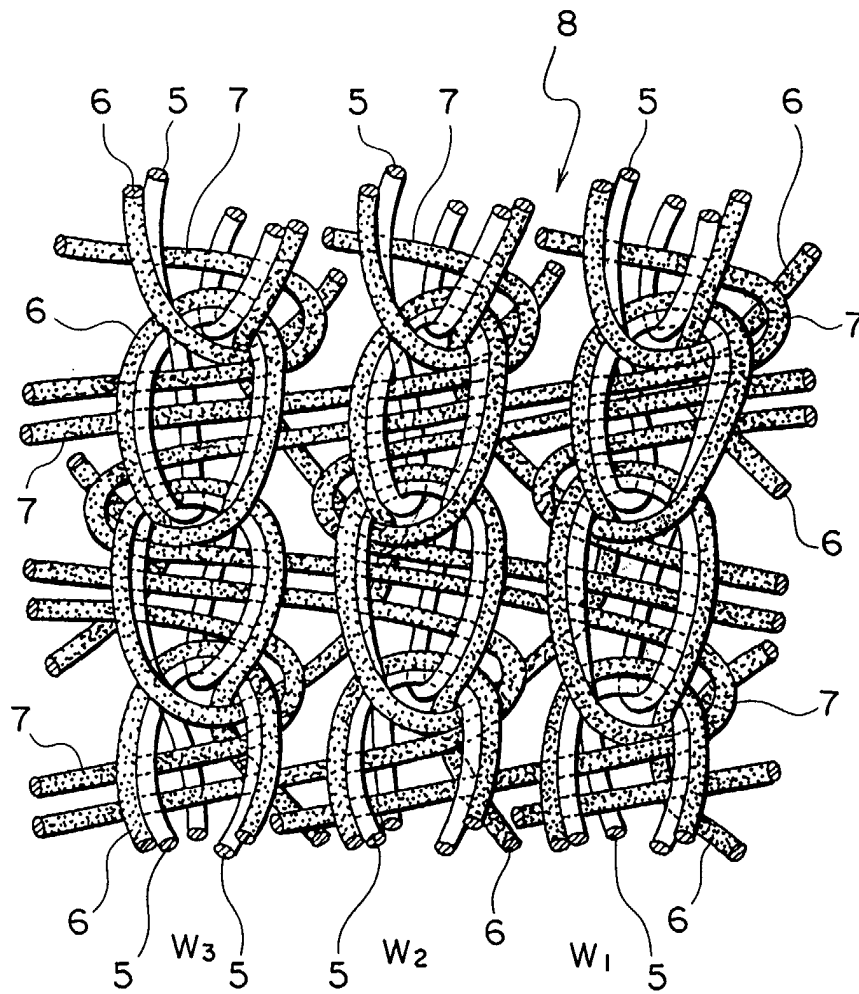


FIG. 4

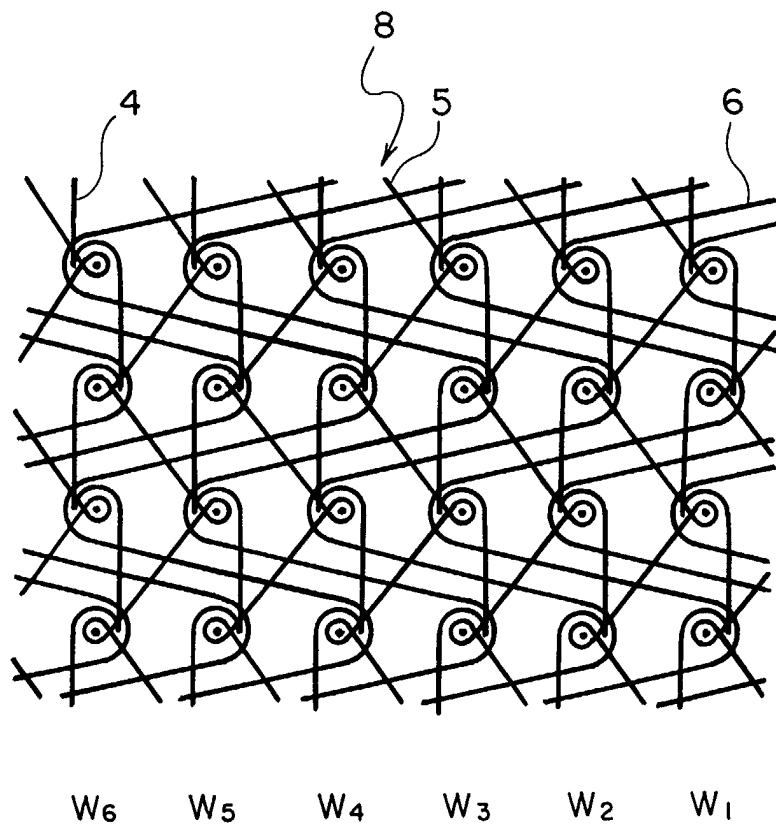


FIG. 5

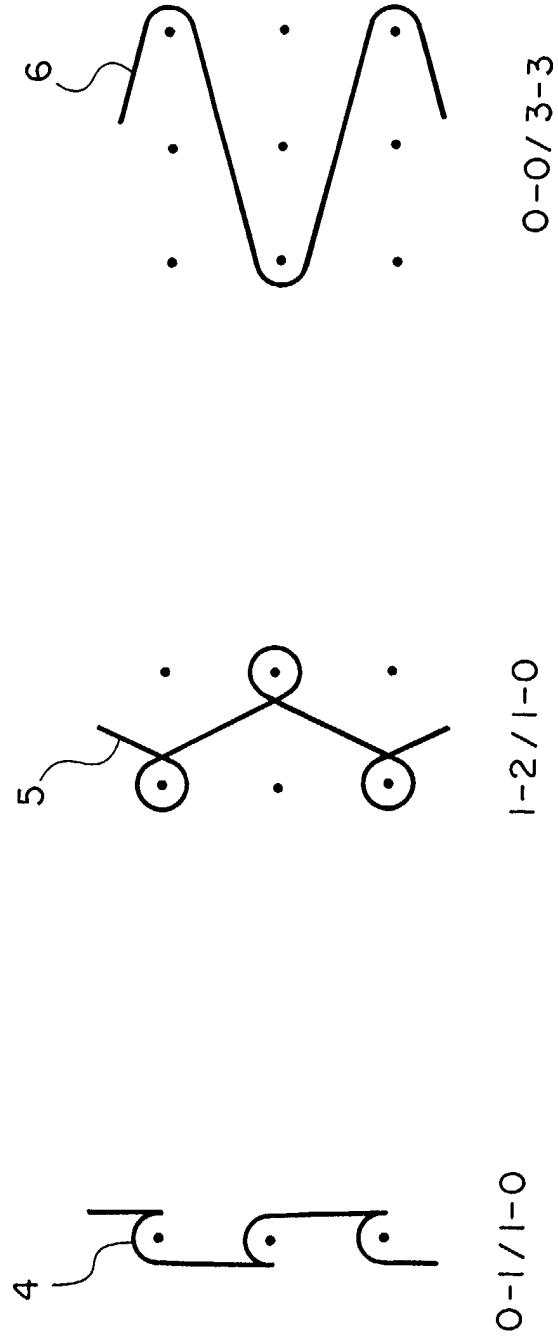


FIG. 6

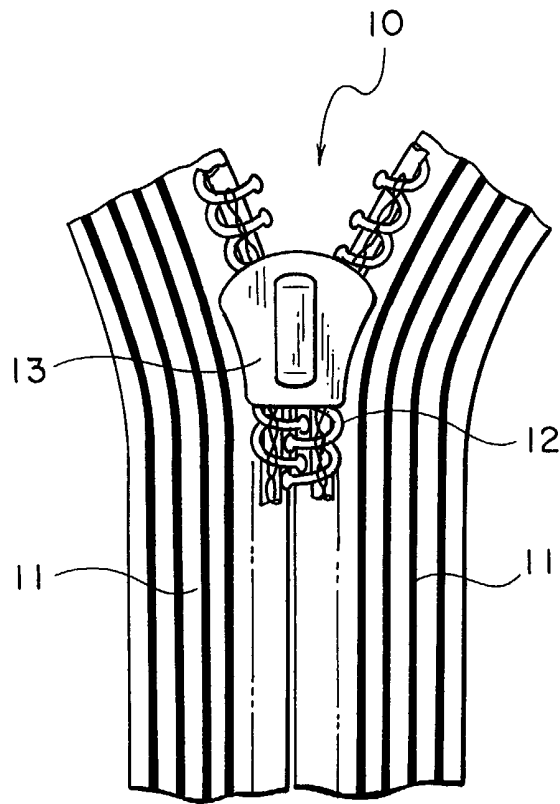


FIG. 7

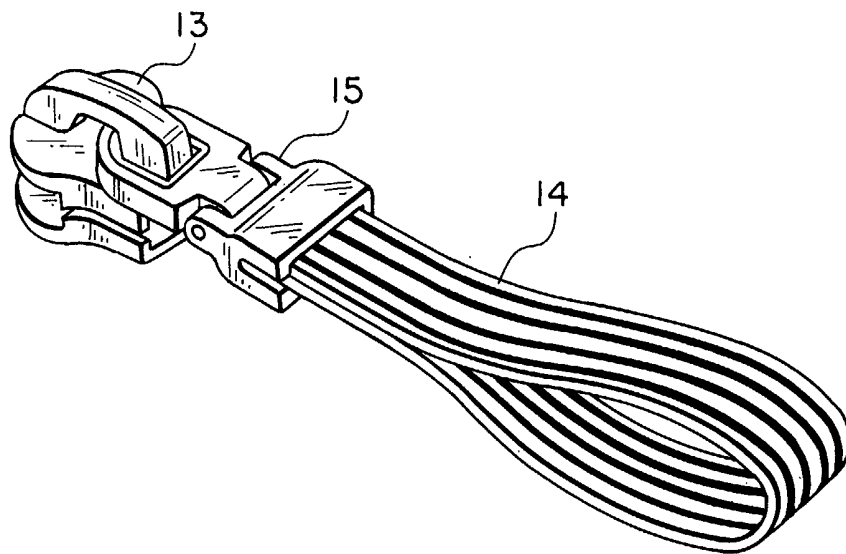
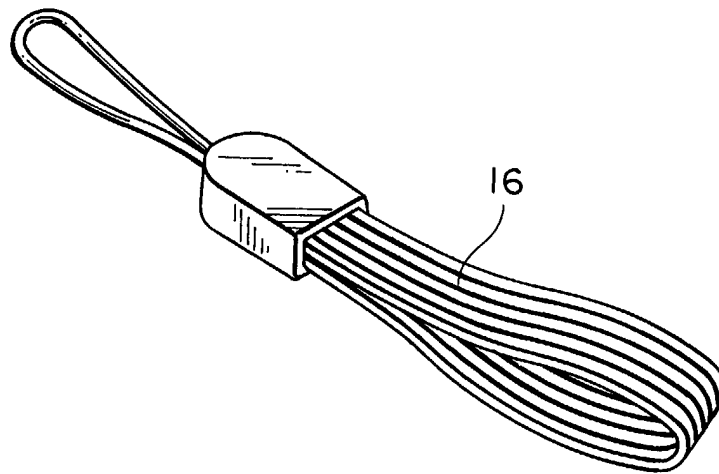


FIG. 8





European Patent
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EUROPEAN SEARCH REPORT

Application Number
EP 02 00 9434

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Place of search MUNICH		Date of completion of the search 11 July 2002	Examiner Dreyer, C
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

EPC FORM 1503.03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
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EP 02 00 9434

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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