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(54) **PROCESS FOR WEAVING THREE-LAYER
WARP-WOVEN FABRIC WITH
PERSPECTIVE EFFECT AND FABRIC
WOVEN BY THE SAME**

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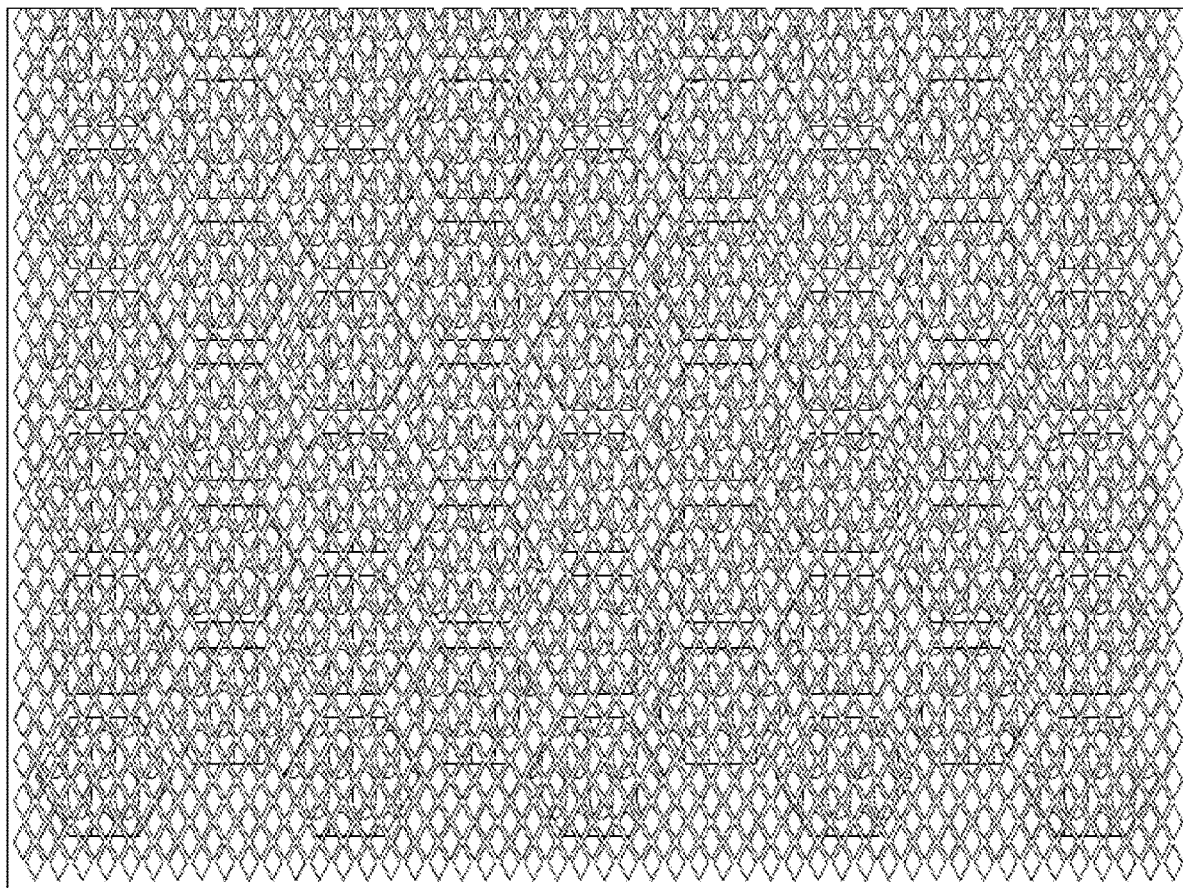
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(57)

ABSTRACT

The disclosure relates to a process for manufacturing three-layer warp-woven fabric with a perspective effect and fabric woven by the same. A dual-needle-bed warp loom is used to weave the fabric; a front needle bed is programmed to weave transparent filaments. Distinguished from the prior art, in the disclosure, the transparent filaments are woven at the front needle bed, so that the fabric at the front needle bed becomes transparent, and the jacquard guide bar generates the weft insertion stitch at the front needle bed and the loop stitch at the rear needle bed, so that the front and rear needle beds of the jacquard guide bar weave different stitches to finally obtain three-layer warp-woven fabric with a perspective effect (the color and shape of the middle or bottom layer are visible), achieving an irregular concave-convex effect in different areas with color visible.



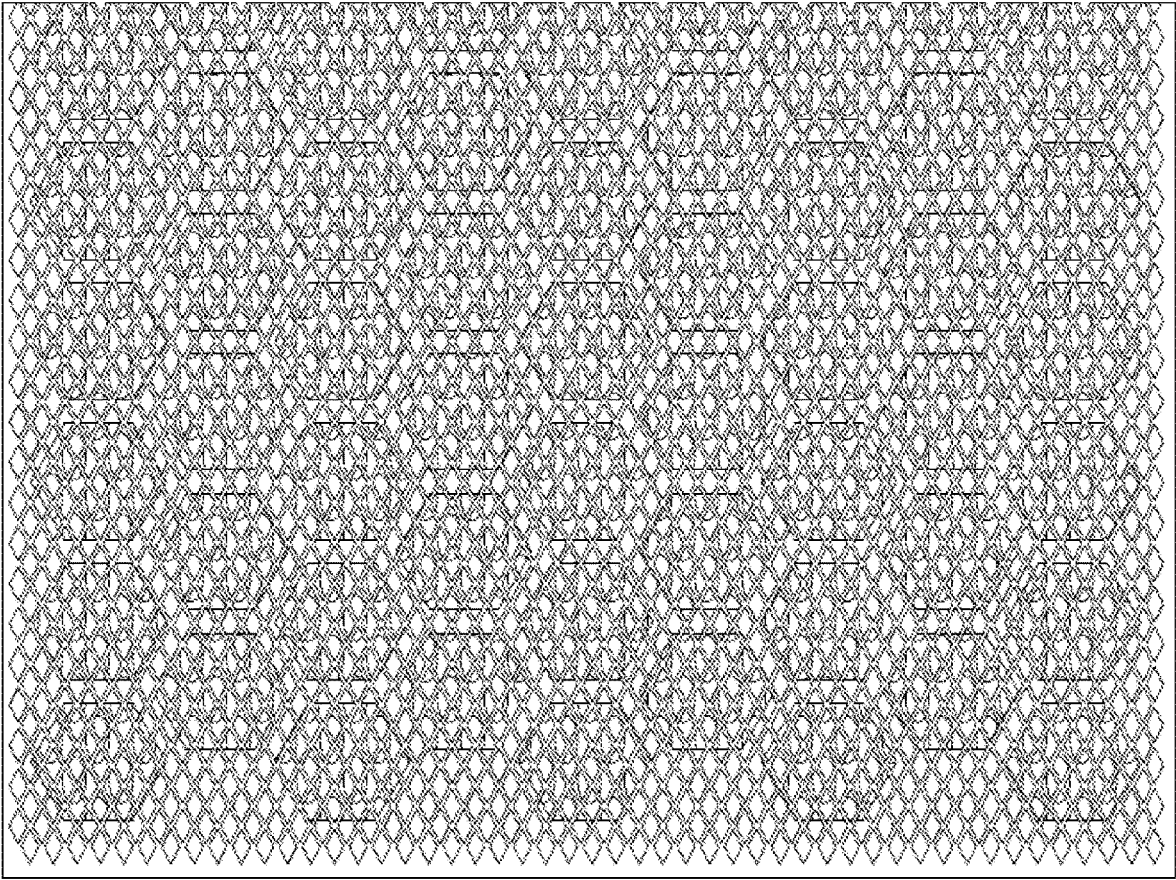


FIG. 1

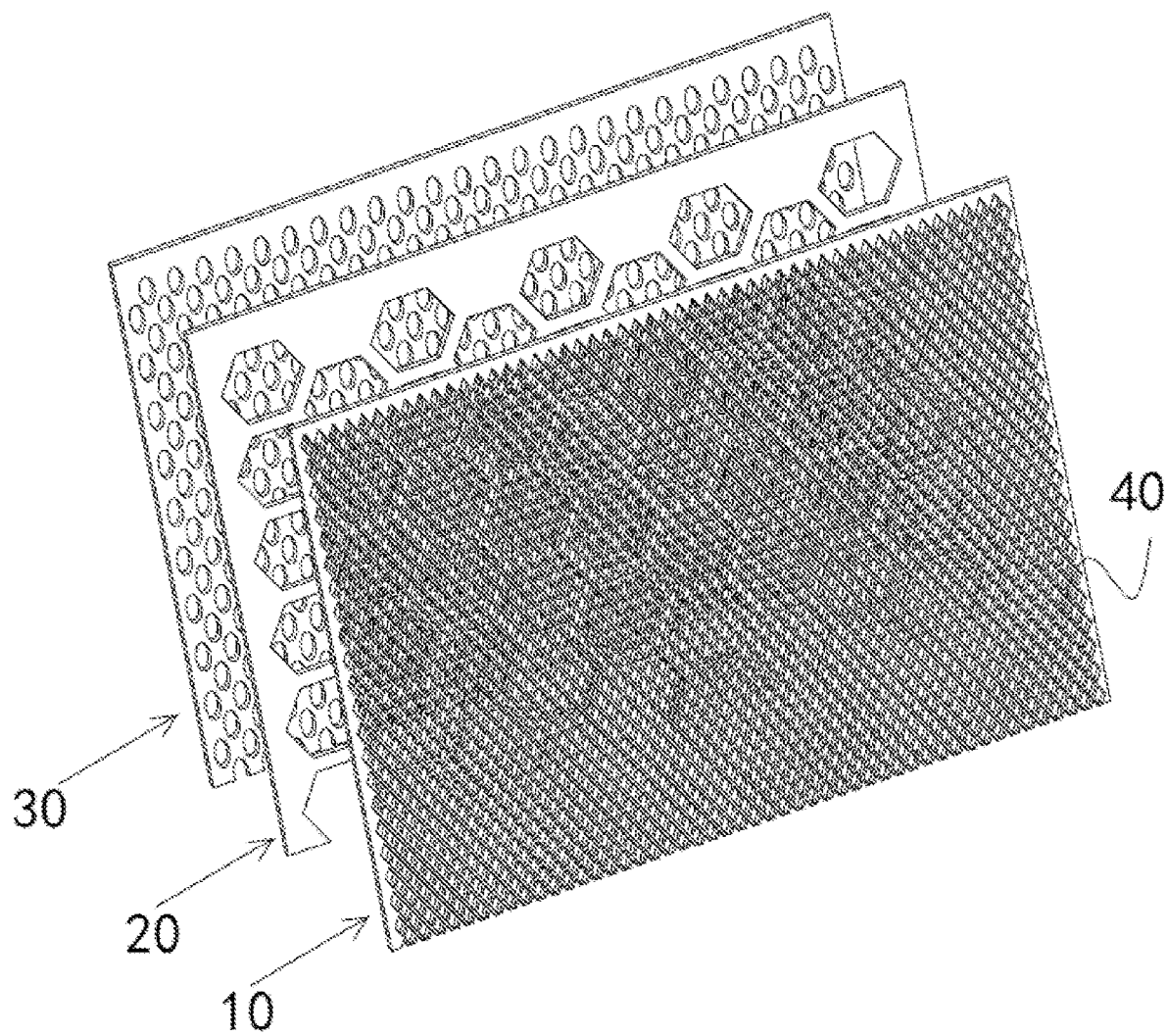


FIG. 2

PROCESS FOR WEAVING THREE-LAYER WARP-WOVEN FABRIC WITH PERSPECTIVE EFFECT AND FABRIC WOVEN BY THE SAME

TECHNICAL FIELD

[0001] The disclosure relates to the technical field warp-woven fabric, in particular to a process for weaving three-layer warp-woven fabric with a perspective effect and fabric woven the same.

DESCRIPTION OF THE RELATED ART

[0002] Layered fabric which has a visible jacquard middle layer with a concave-convex effect has been available in the market. Such fabric is formed with jacquard patterns through repeated operation of common middle guide bars at front and rear needle beds of a common dual-needle-bed warp loom. The patterns can only form fixed stitches. Random jacquard design cannot be obtained.

Contents of the Present Invention

[0003] For this reason, a process for weaving three-layer warp-woven fabric with a perspective effect and fabric woven by the same are required to solve the technical problem of failing to obtain random jacquard design in the middle layer in prior art.

[0004] To achieve the above objective, a process for weaving three-layer warp-woven fabric with a perspective effect is provided, wherein a dual-needle-bed jacquard warp loom is adopted to weave the fabric;

[0005] wherein a front needle bed is programmed to weave transparent monofilaments, or a rear needle bed is programmed to weave transparent monofilaments, or the front and rear needle beds are both programmed to weave transparent monofilaments;

[0006] wherein a jacquard guide bar shuttles between the front needle bed and the rear needle bed to generate a jacquard middle layer, and the jacquard guide bar generates weft insertion stitches at the front needle bed and loop stitches at the rear needle bed.

[0007] As a preferred process of the disclosure, the yarn feeding speed of the front needle bed and the rear needle bed is 2000-3000 mm/rack.

[0008] As a preferred process of the disclosure, the yarn feeding speed of the jacquard guide bar is 4000-10000 mm/rack at the front needle bed and 200-400 mm/rack at the rear needle bed.

[0009] As a preferred process of the disclosure, the laid-in yarn stitch of the jacquard guide bar is any one of 1-0-0-0/0-1-1-1//, 1-0-1/1-2-1-1//, 1-0-1-0/1-2-1-2//, 1-0-1-0/1-2-1-2// and 1-0-1-2/2-3-2-1//.

[0010] As a preferred process of the disclosure, two jacquard guide bars are included, namely a first jacquard guide bar and a second jacquard guide bar, wherein the first jacquard guide bar shuttles between the front needle bed and the rear needle bed to generate a jacquard middle layer, the first jacquard guide bar generates weft insertion stitches at the front needle bed and loop stitches at the rear needle bed;

[0011] and the second jacquard guide bar jacquard weaves at the front needle bed or the rear needle bed.

[0012] Distinguished from the prior art, the above technical solution features that the front needle bed is programmed to weave the transparent monofilaments to obtain a trans-

parent cloth layer at the front needle bed, so that the shape and color of the middle cloth layer can be seen via the transparent cloth layer. The jacquard guide bar generates the weft insertion stitches at the front needle bed and the loop stitches at the rear needle bed, so that the jacquard guide bar weave different stitches at the front and rear needle beds to finally obtain three-layer warp-woven fabric with a perspective effect (the color and shape of the middle or bottom layer are visible), achieving an irregular concave-convex effect in different areas with color visible.

[0013] To achieve the above objective, three-layer warp-woven fabric with a perspective effect is provided, including a surface layer, a bottom layer and a middle layer which connects the surface layer and the bottom layer;

[0014] wherein the surface layer is woven with transparent monofilaments, the middle layer is a jacquard design layer, and a 0.5-10 mm wide pattern or character is formed in the middle layer through jacquard weaving.

[0015] As a preferred structure of the disclosure, the surface layer and the bottom layer are both plain weave or jacquard weave.

[0016] As a preferred structure of the disclosure, the surface layer and the bottom layer are both a mesh structure, but the surface layer and the bottom layer are different in the mesh size.

[0017] Distinguished from the prior art, the above technical solution features that the surface layer is woven with the transparent monofilaments to obtain a transparent cloth layer, so that the color and shape of the middle cloth layer can be seen via the surface cloth layer. The middle layer is a jacquard design layer formed with a 0.5-2 mm wide pattern or character through jacquard weaving, which means that the shape of the jacquard pattern or character can be seen via the surface cloth layer. Finally, the three-layer warp-woven fabric with a perspective effect (the color and shape of the middle or bottom layer are visible) is obtained, achieving an irregular concave-convex effect in different areas with color visible.

DESCRIPTION OF SEVERAL VIEWS OF THE ATTACHED DRAWINGS

[0018] FIG. 1 is a front view of three-layer warp-woven fabric with a perspective effect in specific embodiment;

[0019] FIG. 2 is an exploded view of three-layer warp-woven fabric with a perspective effect in the specific embodiment.

DESCRIPTION OF MARKS IN THE ATTACHED DRAWINGS

[0020] 10. Surface layer;

[0021] 20. Middle layer;

[0022] 30. Bottom layer;

[0023] 40. Mesh.

DESCRIPTION OF PREFERRED EMBODIMENT

[0024] To clarify the technical content, structural characteristics, objective and effects of the technical solution, the disclosure is described in detail below in conjunction with specific embodiment and attached drawings.

Embodiment 1

[0025] This embodiment provides a process for weaving three-layer warp-woven fabric with a perspective effect, wherein a dual-needle-bed jacquard warp loom is adopted to weave the fabric,

[0026] wherein a front needle bed is programmed to weave transparent monofilaments;

[0027] wherein a jacquard guide bar shuttles between the front needle bed and the rear needle bed to generate a middle jacquard design layer, and the jacquard guide bar generates weft insertion stitches at the front needle bed and loop stitches at the rear needle bed.

[0028] Jacquard design is concave-convex patterns of fabric which are formed through interlocking of weft and warp yarns.

[0029] Weft insertion stitch is a type of design stitch of a warp-knitted fabric, featuring regular weft insertion of non-looped yarns in the traverse direction of fabric. The weft-insertion warp-knitting stitch is classified into two types, namely weft insertion and full width weft insertion. The weft insertion warp-knitting stitch is formed by complete post-needle movement of one or several weft insertion guide bars in the looping process (without pre-needle movement), so that the weft yarns are held between loops and extensions of the background stitch to obtain required properties and effects.

[0030] Loop stitch refers to a process of making yarns into loops using knitting needles of the warp loom and other looping devices. On the warp loom, yarns in parallel are guided from the beams and then respectively placed at knitting needles to form loops. Usually, each yarn is only laid in at one or two knitting needles to form transverse loop rows after loops are formed. In one transverse row, each of the loops is interlocked with each corresponding loop in the upper transverse row, so that transverse rows are mutually connected. At the same time, yarns are laid in at different knitting needles in a certain sequence to make the longitudinal columns of the loops mutually correlated after loops are formed, thus generating the warp-knitting fabric.

[0031] The use of yarns at needle beds is unlimited, which means that yarns of different sizes and different raw materials can be used.

[0032] In this embodiment, the yarn feeding speed of the front needle bed and the rear needle bed is 2000 mm/rack; and the yarn feeding speed of the jacquard guide bar is 4000 mm/rack at the front needle bed and 200 mm/rack at the rear needle bed.

[0033] The laid-in yarn stitch of the jacquard guide bar is 1-0-0-0/0-1-1-1//.

[0034] Further, two jacquard guide bars are included, namely a first jacquard guide bar and a second jacquard guide bar, wherein the first jacquard guide bar shuttles between the front needle bed and the rear needle bed to form a jacquard middle layer, the first jacquard guide bar generates weft insertion stitches at the front needle bed and loop stitches at the rear needle bed; and the second jacquard guide bar jacquard weaves at the front needle bed or the rear needle bed. In this embodiment, dual jacquard guide bars are accepted, so does a single jacquard guide bar. In case of dual jacquard guide bars, it needs to be ensured that at least one jacquard guide bar jacquard weaves at the front and rear needle beds to generate a middle jacquard design layer, and the other jacquard guide bar can jacquard weave at any needle bed.

Embodiment 2

[0035] This embodiment provides a process for weaving three-layer warp-woven fabric with a perspective effect, which is distinguished from embodiment 1 in that the rear needle bed is programmed to weave the transparent monofilaments.

Embodiment 3

[0036] This embodiment provides a process for weaving three-layer warp-woven fabric with a perspective effect, which is distinguished from embodiment 1 in that the front and rear needle beds are both programmed to weave the transparent monofilaments.

Embodiment 4

[0037] This embodiment provides a process for weaving three-layer warp-woven fabric with a perspective effect, which is distinguished from embodiment 1 in that the yarn feeding speed of the front needle bed is 2500 mm/rack.

Embodiment 5

[0038] This embodiment provides a process for weaving three-layer warp-woven fabric with a perspective effect, which is distinguished from embodiment 1 in that the yarn feeding speed of the front needle bed is 3000 mm/rack.

Embodiment 6

[0039] This embodiment provides a process for weaving three-layer warp-woven fabric with a perspective effect, which is distinguished from embodiment 1 in that the yarn feeding speed of the rear needle bed is 2500 mm/rack.

Embodiment 7

[0040] This embodiment provides a process for weaving three-layer warp-woven fabric with a perspective effect, which is distinguished from embodiment 1 in that the yarn feeding speed of the rear needle bed is 3000 mm/rack.

Embodiment 8

[0041] This embodiment provides a process for weaving three-layer warp-woven fabric with a perspective effect, which is distinguished from embodiment 1 in that the yarn feeding speed of the jacquard guide bar at the front needle bed is 7000 mm/rack.

Embodiment 9

[0042] This embodiment provides a process for weaving three-layer warp-woven fabric with a perspective effect, which is distinguished from embodiment 1 in that the yarn feeding speed of the jacquard guide bar at the front needle bed is 10000 mm/rack.

Embodiment 10

[0043] This embodiment provides a process for weaving three-layer warp-woven fabric with a perspective effect, which is distinguished from embodiment 1 in that the yarn feeding speed of the jacquard guide bar at the rear needle bed is 300 mm/rack.

Embodiment 11

[0044] This embodiment provides a process for weaving three-layer warp-woven fabric with a perspective effect, which is distinguished from embodiment 1 in that the yarn feeding speed of the jacquard guide bar at the rear needle bed is 400 mm/rack.

Embodiment 12

[0045] This embodiment provides a process for weaving three-layer warp-woven fabric with a perspective effect, which is distinguished from embodiment 1 in that the laid-in yarn stitch of the jacquard guide bar of the middle layer is 1-0-1/1-2-1-1//.

Embodiment 13

[0046] This embodiment provides a process for weaving three-layer warp-woven fabric with a perspective effect, which is distinguished from embodiment 1 in that the laid-in yarn stitch of the jacquard guide bar of the middle layer is 1-0-1-0/1-2-1-2//.

Embodiment 14

[0047] This embodiment provides a process for weaving three-layer warp-woven fabric with a perspective effect, which is distinguished from embodiment 1 in that the laid-in yarn stitch of the jacquard guide bar of the middle layer is 1-0-1-0/1-2-1-2//.

Embodiment 15

[0048] This embodiment provides a process for weaving three-layer warp-woven fabric with a perspective effect, which is distinguished from embodiment 1 in that the laid-in yarn stitch of the jacquard guide bar of the middle layer is 1-0-1-2/2-3-2-1//. The laid-in yarn stitch of the jacquard guide bar is not limited to the above embodiment, and can be changed freely.

[0049] Distinguished from the prior art, in this embodiment, the front needle bed is programmed to weave the transparent monofilaments to obtain a transparent cloth layer at the front needle bed, so that the shape and color of the middle cloth layer can be seen via the transparent cloth layer. The jacquard guide bar generates the weft insertion stitches at the front needle bed and the loop stitches at the rear needle bed, so that the jacquard guide bar weave different stitches at the front and rear needle beds to finally obtain three-layer warp-woven fabric with a perspective effect (the color and shape of the middle or bottom layer are visible), achieving an irregular concave-convex effect in different areas with color visible.

Embodiment 16

[0050] Refer to FIG. 1 and FIG. 2. This embodiment provides three-layer warp-woven fabric with a perspective effect, including a surface layer 10, a bottom layer 30 and a middle layer 30 which connects the surface layer and the bottom layer 20;

[0051] wherein the surface layer is woven with transparent monofilaments, the middle layer is a jacquard design layer, and a 0.5-10 mm wide pattern or character is formed in the middle layer through jacquard weaving. In this embodiment, the jacquard pattern is a honeycomb-shaped pattern.

[0052] In this embodiment, the surface layer is of a rhombic mesh 40 structure, and the bottom layer is of an elliptical mesh 40 structure. The size of the elliptical mesh is greater than that of the rhombic mesh.

Embodiment 17

[0053] This embodiment provides three-layer warp-woven fabric with a perspective effect, which is distinguished from the fabric in embodiment 14 in that the jacquard pattern is a 5 mm wide pattern or character.

Embodiment 18

[0054] This embodiment provides three-layer warp-woven fabric with a perspective effect, which is distinguished from the fabric in embodiment 14 in that the jacquard pattern is a 10 mm wide pattern or character.

Embodiment 19

[0055] This embodiment provides three-layer warp-woven fabric with a perspective effect, which is distinguished from the fabric in embodiment 14 in that the surface layer is plain weave, the bottom layer is jacquard, wherein jacquard fabric is also called large-pattern fabric which is large-pattern stitch woven using a jacquard loom, and the full width stitch includes hundreds and even thousands of warps. The jacquard design usually takes one stitch (background stitch) as the basis and displays another or several different stitches such as plain stitch and satin stitch to form patterns on the background stitch.

Embodiment 20

[0056] This embodiment provides three-layer warp-woven fabric with a perspective effect, which is distinguished from the fabric in embodiment 14 in that the bottom layer is a plain weave layer, the surface layer is jacquard design layer, and the surface layer and the bottom layer can be plain weave, or jacquard design layers such as vamp, which is not limited.

[0057] Distinguished from the prior art, in this embodiment, the surface layer is woven with the transparent monofilaments to obtain a transparent cloth layer, so that the color and shape of the middle cloth layer can be seen via the surface cloth layer. The middle layer is a jacquard design layer formed with a 0.5-2 mm wide pattern or character through jacquard weaving, which means that the shape of the jacquard pattern or character can be seen via the surface cloth layer. Finally, the three-layer warp-woven fabric with a perspective effect (the color and shape of the middle or bottom layer are visible) is obtained, achieving an irregular concave-convex effect or a color transparency effect in different areas.

[0058] It should be noted that in this text the relational terms such as “first” and “second” are merely used to distinguish one object or operation from another object or operation, and not necessarily require or hint that those objects or operations have any such actual relationship or are in such actual sequence. Moreover, the terms “including”, “comprising”, or any other variants are used to cover non-exclusive inclusion, so that processes, methods, articles or terminal devices, each of which includes a series of factors, include not only those factors but also other unlisted factors, or also include other inherent factors of such processes, methods, articles or terminal devices. Without more limita-

tions, the factors defined by sentences “including . . .” or “comprising . . .” do not exclude that the processes, methods, articles or terminal devices including the above-mentioned factors also incorporate other factors. Besides, in this text, terms such as “greater”, “smaller”, “exceed” should be understood to exclude the listed number; and terms such as “above”, “below” and “within” should be understood to include the listed number.

[0059] Despite detailed description of the above embodiment, those skilled in the art can make other changes or modifications to the above embodiment by using the basic inventive concepts. Therefore, the above-mentioned embodiment is a part of the embodiment of the disclosure, and shall not be understood to limit the patent protective scope of the disclosure. All equivalent structures or equivalent process conversions made on the basis of the description and attached drawings of the disclosure or direct or indirect application thereof to other relevant technical fields shall fall within the protective scope of the disclosure.

What is claimed is:

1. A process for weaving three-layer warp-woven fabric with a perspective effect, the fabric woven using a dual-needle-bed jacquard warp loom, characterized in that,

a front needle bed is programmed to weave transparent monofilaments, or a rear needle bed is programmed to weave transparent monofilaments, or the front and rear needle beds are both programmed to weave transparent monofilaments;

wherein a jacquard guide bar shuttles between the front needle bed and the rear needle bed to generate a middle jacquard design layer, and the jacquard guide bar generates weft insertion stitches at the front needle bed and loop stitches at the rear needle bed.

2. The process for weaving three-layer warp-woven fabric with a perspective effect according to claim 1, wherein the yarn feeding speed of the front needle bed is 2000-3000 mm/rack.

3. The process for weaving three-layer warp-woven fabric with a perspective effect according to claim 1, wherein the yarn feeding speed of the jacquard guide bar is 4000-10000 mm/rack at the front needle bed and 200-400 mm/rack at the rear needle bed.

4. The process for weaving three-layer warp-woven fabric with a perspective effect according to claim 1, wherein the laid-in yarn stitch of the jacquard guide bar is any one of 1-0-0-0/0-1-1-1//, 1-0-1/1-2-1-1//, 1-0-1-0/1-2-1-2//, 1-0-1-0/1-2-1-2// and 1-0-1-2/2-3-2-1//.

5. The process for weaving three-layer warp-woven fabric with a perspective effect according to claim 1, wherein two jacquard guide bars are provided, namely a first jacquard guide bar and a second jacquard guide bar, wherein the first jacquard guide bar shuttles between the front needle bed and the rear needle bed to form a jacquard middle layer, the first jacquard guide bar generates weft insertion stitches at the front needle bed and loop stitches at the rear needle bed;

and the second jacquard guide bar jacquard weaves at the front needle bed or the rear needle bed.

6. Three-layer warp-woven fabric with a perspective effect, comprising a surface layer, a bottom layer and a middle layer which connects the surface layer and the bottom layer;

wherein the surface layer is woven with transparent monofilaments, the middle layer is a jacquard design layer, and a 0.5-10 mm wide pattern or character is formed in the middle layer through jacquard weaving.

7. The three-layer warp-woven fabric with a perspective effect according to claim 6, wherein the surface layer and the bottom layer are both plain weave or jacquard design layers.

8. The three-layer warp-woven fabric with a perspective effect according to claim 6, wherein the surface layer and the bottom layer are both mesh layers, and the surface layer and the bottom layer are different in mesh size.

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