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MAPPING TOPOLOGY OF THREE-DIMENSIONAL OF THREE LAYERS WOVEN FABRICS "SAME DIRECTION IN FACE & BACK"

Purpose. *The main objective of this research is to innovation a method of design, simulation and virtual display for three layers woven Jacquard fabrics stitches systems of mapping topology of fabrics.*

Keywords: *Three Layers, Woven Fabrics, Stitches, jacquard, Fabrics topology.*

Introduction. In this way, the aim if this paper is to further investigate the influence of integration factor construction to improving aesthetic, physical and mechanical properties of three layers layer woven fabrics by denting and stitches systems.

Methods of research. A practical and effective computer-aided method for the design, simulation and virtual display of three layers woven fabrics stitches systems of mapping topology of fabrics is presented in this research.

Results. Innovation mapping topology of fabric computer-aided design has become a hot research topic in recent years. The main objective of this research is to innovation a method of design, simulation and virtual display for three layers woven Jacquard fabrics stitches systems of mapping topology of fabrics. Preferentially, the fabric design and simulation models were established and the virtual yarns are intermeshed by connecting each control point of the woven to generate the structural simulation. The simulated image was captured as the woven design image. The virtual display method of the three-dimensional based on woven design mapping was mainly studied and innovated. Woven design matching was realized based on the three-dimensional piece models and the vertices texture coordinates of three-dimensional models were reset, then virtual display was realized according to the mapping relationship between the triangles. During this process, the position of the woven design can be dynamically designed and adjusted to achieve the desired effect. This research introduced the design of four kinds of stitches systems of mapping topology of fabrics and illustrated the

corresponding simulation and virtual display effect to verify the feasibility of the method. The analysis of simulation efficiency reveals that the method responds quickly and has favorable adaptability to diverse patterns and models. The research provides a new idea for the computer-aided design of three layers woven fabrics mapping topology of fabrics and promotes the development of personalized three-dimensional customization.

Fig. 1. **Direction in face clothe in first fabric 'face"**

Fig. 2. **Direction in back clothe in second fabric "back"**

Conclusions. Preferentially, the design and simulation model were constructed respectively because of the function of the mapping fingers and the particularity of the three layers woven fabrics method. The virtual yarns are intermeshed by connecting each control point of the woven. Based on the structural simulation generated by the above method, a woven design mapping method based on the three-dimensional piece models to reset the vertex woven design of the three multilayers woven jacquard fabrics Stitches Systems woven

jacquard mapping topology (JFMT) model was innovated of direction in Face & back. The woven design matching was realized by adjusting the position of vertical and horizontal translation and repetition of woven design on the 2D piece models of parts, and then the woven design was mapped to the surface of the three-dimensional models to achieve the virtual display. In this process, the woven design matching the position of the 2D models can be adjusted arbitrarily according to the design requirements, and the adjusted effect will be immediately displayed in the 3D virtual model, so as to achieve real-time response and dynamic design. The effectiveness of this method was verified by introducing four designs of stitches systems of mapping topology of fabrics and demon-starting their simulation and virtual display effects. The simulation efficiency of this method was discussed, which can respond quickly and meet the demands of most patterns and models. Furthermore, and direction in Face & back this research can provide a new idea for computer-aided simulation and virtual display of three layers woven fabrics mapping topology of fabrics and promote the development of personalized three-dimensional customization. However, in order to avoid the effect of rendering large computation on simulation efficiency, yarn details were not considered in mapping topology of fabric simulation, and the realistic sense of yarns was insufficient. In addition, it is necessary to study further the located woven design map- ping method which is suitable for shaped three-dimensional pieces.

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