Application of Visual Illusion Patterns on Modern Women's Knitwear Design ⋆

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Abstract

The jersey knitwear market occupies most of the knitting market due to its relatively simple manufacturing process and high public acceptance. Pattern design composed of some simple lines and geometric patterns usually applied to jersey knitwear, but it can not take advantage of knitting fabrics as much as possible. Therefore, in order to combine the merit of knitwear, the research process is as follows: firstly, learning about women's preferences for knitwear in their 30s and 50s through questionnaire distribution and in-store inquiries. Secondly, designing and producing urban women's knitwear collections with optical illusion patterns. The yarn used in this design experiment is mostly 100% 80s Australian wool, and the equipment is STOLL M1 plus—a computerized flat knitting machine, all of which are provided and assisted by the FSF factory, Suzhou, China. It is finally determined that the jacquard pattern put into production is double-sided birdeye jacquard and air layer jacquard. In terms of the final collection effect, the design ideas of "Fake Two Pieces" and "Simulated Pleated Skirt" are reflected in the collection named "chengSHi". The combination of knitwear and optical illusion patterns dramatically simplifies the production process and improves production efficiency owing to knitwear's one-piece weaving. Moreover, it also provides new inspiration for knitwear design.

Keywords: Optical Illusion Pattern; Knitwear Design; Pattern Design; Visual Effects; Flat Knitting

1   Introduction

With the improvement of people's consumption power and the changes in consumption habits over recent years, the apparel and apparel market has shown a diversified development trend. In modern, fast-paced life, people no longer blindly pursue fashion circles but focus more on

personal experience [1]. Investigation and research show that due to the skin-friendly, breathable and soft texture of knitwear, people have become more inclined to choose knitted garments. The knitting market is expanding year by year, and it still has great potential in the future [2]. Although China is a big country in the production of knitwear, the knitting factories are faced with many problems, such as small production scale, single styles of garments and hard to keep up with international trends, unstable yarn quality, lack of major design innovations. Under this circumstance, integrating fascinating visual illusions with larger design space into traditional knitted garments can improve the current predicament of the knitting industry.

Based on the knitting effect, the types of knitwear can be classified into the types of hand-knitting, crochet, and jersey knitting [3, 4]. In recent years, full-body knitted suits have become fashionable in women's clothing market. The typical patterns applied in this type of knitted garments consist of stripes and simple geometric patterns, which shows a lack of creative innovation. Some research have been conducted to investigate the effect of knitwear designs, such as knitting pattern weaving, knitwear design, and modern knitting technology [5-11]. Although various results have been acquired, there are but few specific instances of research on designing and integrating optical illusion patterns to knitwear designs [12-18].

In this study, an age-based sample consisting of consumers of 30 to 50 years old who prefer high-quality materials of knitwear is defined, and 100% 80s Australian wool is applied for the experiments and design applications. Merino wool, thick, heavy, comfortable but not accessible to balling up, is particularly sought-after by urban women. It has better air permeability when compared with other conventional materials. Combining knitwear with visual illusion patterns is the innovation of this article. Optical illusion patterns were programmed through the Stoll M1 plus software, then woven together with the knitted fabric. On the one hand, it is concluded that optical illusion patterns could be designed and applied in stylish knitwear to fully cater consumers' needs with unique aesthetics while improving production efficiency and simplifying the production process. On the other hand, it is also a sustainable design avoiding excessive yarns dyeing and printing molds making.

2   Methodology

This study is conducted by following the criteria of knitwear design proposed by Eckert C. And its process is divided into eleven steps, including source reviewing, fashion research, theme selection, yarn selection, design framework, swatch sampling, shape design, garment design, detailed design,

Table 1: Research process

Step	Procedure	Synopsis
S1	Market research	Consumer preferences
S2	Inspiration	Design motifs from Shanghai
S3	Material	Wool
S4	Equipment	Stoll M1 plus
S5	Jacquard	Sesame dot
S6	Sample	Representative
S7	End product	Knitwear design