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THE TREND OF ART FASHION DESIGN – THE COLLISION AND FUSION OF NATURAL AND TECHNOLOGICAL FABRICS

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This paper discusses the merging trend of natural and craft fabrics. It can also be understood as the technological reshaping of natural materials. Through the integration of material mixing, process innovation, and new design concepts, this study explores how to combine natural fabrics and technological fabrics to achieve personalized customization of clothing to meet the increasingly diverse needs of consumers.

Key words: art fashion design, natural fabric, science and technology fabric, collision and fusion, tendency.

INTRODUCTION

In recent years, resource overuse, pollution, and textile waste have intensified fashion sustainability concerns. New materials and technologies enable eco-friendly solutions. The fusion of natural and technological fabrics is a key trend, whose causes, forms, and prospects this paper analyzes.

PURPOSE

This study aims to analyze the significance of the collision and fusion of natural fabrics and technological fabrics and explore the fashion industry's development direction in environmental protection, functionality, personalization, technology, and other aspects. It also reveals how designers influence the sustainable development of the fashion industry and the concept of artistic design.

RESULTS AND DISCUSSION

This paper discusses the basic characteristics and classification of natural fabrics and craft fabrics and introduces new fabrics such as recycled fibers and smart fabrics. First, the designer will use the "chemical fusion" method. Natural fibers combine scientific and technological components (such as functional additives) evenly into natural fabrics through specific chemical reactions. For example, high-tech dissolution, purification, and spinning processes are used to convert natural cellulose, such as straw and bark, into recyclable fibers. Dr. Manel Torres invented the spray weaving technique. This high-tech spray liquid is made from cotton and synthetic fibers added to a polymer solution. When the liquid touches the skin, it dries quickly, and the fibers accumulate on the body surface to form a matte, non-woven material. According to Dr. Torres, the liquid fabric is so



flexible that it can be sprayed on any surface, even in water, and has great potential for many applications. In the medical field, the technology is expected to be used to develop sterile bandages to control bleeding or to provide instant clothing spraying for patients with mobility problems. In addition, another highlight of this technology is that the spray fabric can be easily recovered and converted into a liquid, thus enabling recycling [1].

The second point is "physical integration," which involves utilizing technologies such as coating, embossing, and embroidery to structurally combine scientific and technological fabrics with natural fabrics, creating a fabric with dual characteristics. For example, designers can create a molecular protective layer on the surfaces of natural fibers, such as cotton and linen, by spraying nanoscale fiber coating or waterproof material. This technology not only retains the breathability of plant fibers but also realizes surface hydrophobic and wear-resistant modification through polymer penetration. The super-elastic sunscreen sports set combines the spiral super-elastic technology with a waterproof coating, which provides both sun protection and dynamic stretching. As for the embossing composite process, designers use high temperature and high pressure to physically press recycled nylon and other scientific and technological materials with natural fabrics to form a double-layer heterogeneous structure. Such as GRS-certified recycled nylon and natural fiber composite fabric through the special-shaped cross-section design to achieve double antibacterial and flexibility [2].

Another example is the partnership between the SEAQUAL Initiative and local communities, including fishermen and NGOs, which aims to integrate marine conservation with sustainable production through a closed-loop process of "marine waste recycling - material recycling - product manufacturing." "First of all, fishermen, as practitioners of the Marine front line, assume the core role of cleaning up plastic waste (such as discarded fishing nets, plastic bottles, buoys, etc.) in coastal and shallow sea areas. This technology uses a mixture of physical and chemical processing through the physical synthesis of particles or chemical dissolution into recycled polyester yarn. The yarn, called SEAQUAL, is blended with natural fibers or recycled materials. For instance, the seats of the Fiat Panda Red are made of Seaqual recycled polyester and red stitching for durability and design. PUMA JERSEY jerseys contain 25% SEAQUAL Marine plastic to achieve chemical recycling of old jerseys, breaking traditional recycling limits. SEAQUAL translates Marine protection into quantifiable economic value through the chain of fisherman-NGO coordination - technology conversion - enterprise application. This model not only addresses the source of plastic pollution but also enhances community resilience through localized cooperation, providing a replicable model for "ocean resource recycling" [3].

The third way is 'biological fusion', involving intelligent fibers that mirror the micro-ecological structure of the human body, facilitating intelligent interaction with our skin. This type of fiber cleverly combines spiral hyperelastic technology with natural fibers by mimicking the hierarchical structure of human skin microbiota, forming a unique microporous network with dynamic breathing function. This dynamic breathing function is implemented due to the complex microstructure



design and precise technological means inside the intelligent fibers. The combination of spiral hyperelastic technology and natural fibers provides excellent elasticity and durability while maintaining softness and comfort. The design of a microporous network enables fibers to perform excellently in regulating temperature and humidity, truly realizing the function of intelligent regulation [4].

CONCLUSIONS

Natural fabrics are deeply connected to traditional crafts and culture, representing historical heritage in fashion design, while technological fabrics embody scientific progress, symbolizing innovation and future trends. Key tendencies include the technological reinvention of natural materials and the seamless integration of smart functions. This convergence is not the conquest of nature by technology but a dialogue between technology, nature, and humanity, expanding the boundaries of the textile industry. The future of art fashion design is to transform clothing into a "breathing ecological statement," interwoven with the photosynthesis of rice fields, the plastic memory of the ocean, the breeze temperature of the mountains, and ultimately, the human body—forming a new skin in harmony with the earth. This is perhaps the greatest art of fashion, where technology ceases to be a mere tool and becomes a paintbrush granted to humanity by nature. As fashion products evolve, consumer perceptions and consumption patterns are also shifting.

REFERENCES

1. Li Danni. The significance and future prospect of New spray can fabric technology in the field of clothing [J]. Western Leather, 2023, 45 (03): 148-150. (in Chinese) DOI:10.20143/j.1671-1602.2023.03.042.
2. Zhang Rongzhen, Bai Hao. Smart fibers and fabrics for wearable thermal management [J]. Materials Review, 2025, 39 (01): 5-15.
3. Smith, J., & Johnson, P. (2023). Collaborative efforts in marine conservation: The SEAQUAL Initiative and its impact on local communities and ocean health. Marine Policy, 150, 104798.
4. Ge, F., Peng, J., Tan, J. et al. Color tunable photo-thermochromic elastic fiber for flexible wearable heater. Adv Compos Hybrid Mater 7, 173 (2024). <https://doi.org/10.1007/s42114-024-00994-4>

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ТРЕНД АРТ-ДИЗАЙНУ В МОДІ – ЗІТКНЕННЯ ТА ПОЄДНАННЯ НАТУРАЛЬНИХ І ТЕХНОЛОГІЧНИХ ТКАНИН

У роботі розглядається тенденція поєднання натуральних і ремісничих тканин, що можна трактувати як технологічне переосмислення природних матеріалів. Дослідження аналізує інтеграцію змішування матеріалів, інноваційних процесів і нових дизайнерських концепцій, щоб визначити, як поєднання натуральних і технологічних тканин сприяє персоналізованому виготовленню одягу для задоволення зростаючої різноманітності споживчих запитів.

Ключові слова: художній дизайн моди, натуральні тканини, технологічні тканини, зіткнення і синтез, тенденція.