

Application and exploration of new fabrics under the concept of sustainable fashion

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1 Introduction

Under the background of increasing global environmental crisis and increasing public awareness of environmental protection, sustainable fashion has become a development trend that cannot be ignored in the fashion industry. New fabrics, as a revolutionary technology carrier with great significance, has great strategic value for promoting the green transformation of the industry. The purpose of this discussion is to deeply explore the application status and future prospects of new fabrics under the guidance of sustainable fashion concept, aiming to describe a clear technical path for the fashion industry, and put forward relevant policy suggestions, so as to help the industry to realize the harmonious unity of economic benefits, social justice and environmental protection.

Sustainable fashion, namely a new design concept, it calls for the fashion industry from the selection of raw materials until the end of each link, all need to practice the principle of minimizing environmental impact, and protect the rights of the workers, advocate fair trade, is committed to build a strong inclusive, environmentally friendly fashion ecosystem. Under this framework, the new fabrics not only stand out because of their unique aesthetic characteristics and practicality, but also because they can actively respond to consumers' internal needs for environmental protection and sustainability. By providing environmentally friendly material options, the new fabrics help brands and designers reduce their demand for natural resources, while presenting healthy and safe product choices for consumers. In addition, its application

and promotion will stimulate the technological innovation of the fashion industry, stimulate the overall technological upgrading and industrial structure optimization of the industry, and lay a foundation for the implementation of the sustainable development goals.

In view of the core role of new fabrics in the sustainable fashion chain, this paper deeply analyzes their practical application and potential prospect in the fashion industry. Despite the challenges of cost control, supply chain integration, consumer acceptance and other aspects, new fabrics have shown vigorous vitality, and many international brands have begun to take action to use green materials, highlighting a positive signal of industry change. Looking forward to the future, with the continuous advancement of technological innovation, policy support and market education, the large-scale application of new fabrics will become possible, which is expected to trigger a new round of fashion wave. This not only means that the fashion industry will enter a new era of greener, healthier and more responsible, but will also make substantial contributions to the restoration of the earth's ecosystem and human well-being.

To sum up, the new fabrics are not only the key to promote the evolution of the fashion industry to a sustainable direction, but also the link between technology, policy and market. Only by concerted efforts can we create a green, prosperous and hopeful fashionable future, revitalizing the earth and sustainable development of human civilization.

2 The theoretical basis of the sustainable fashion concept

The definition and connotation of sustainable development

Sustainable development refers to the development mode that not only meets the needs of contemporary people without harming the ability of future generations to meet their needs. It emphasizes the coordination and unity of economy, society and environment, pursues long-term ecological balance and social welfare, and aims to realize the rational utilization of resources and the protection of ecological environment.

Challenges facing the sustainable development of the fashion industry

Challenges facing the sustainable development of the fashion industry include the environmental impact of raw material acquisition, energy consumption and pollution emissions in the production process, the waste of resources caused by the short product life cycle, and the excessive consumer consumption of fast fashion products. In addition, the information asymmetry and the lack of effective recycling mechanism in each link of the industrial chain are also the key factors restricting the development of sustainable fashion.

The development process of the sustainable fashion concept

The development process of sustainable fashion concept can be traced back to the 1980s, when the awareness of environmental protection gradually increased, and people began to pay attention to the environmental pollution problems and waste disposal problems in the process of clothing production. In the 1990s, with the advocacy of Greenpeace and other non-governmental organizations, the concept of sustainable fashion was gradually accepted by more people. At the beginning of the 21st century, with the promotion of consumer environmental awareness and corporate social responsibility, sustainable fashion from the edge to the mainstream, more and more brands began to sustainability as part of its development strategy, and through the use of environmental protection materials, improve the production process, improve the product life cycle to achieve this goal. In recent years, with the progress of science and technology and the research and

development of new materials, the concept of sustainable fashion has been more widely applied and in-depth development.

3 Types and characteristics of the new fabrics

New fabrics, as a product of fashion and technology, cover a variety of categories, each with its own unique features, aiming to meet the needs of different scenarios while achieving environmentally friendly and sustainable development goals. According to the source, it can be classified as bio-based fiber fabrics, recycled fiber fabrics, microbial fiber fabrics, natural dye fabrics and smart textile fabrics. The common characteristics of the above fabrics are to reduce the dependence on natural resources, reduce the energy consumption and environmental pollution in the production process, and at the same time respond to consumers' pursuit of a healthy, comfortable, personalized and environmentally friendly lifestyle.

Bio-based fiber fabric

Biological based fiber fabrics mainly includes from renewable resources such as corn, sugar cane, wood pulp through biological engineering technology into fibers such as polylactic acid fiber, cellulose fiber such fabric has good biodegradability and low environmental impact at the same time have excellent physical and mechanical performance and comfort in the field of clothing home textile show a broad application prospect.

Regenerative fiber fabric

Relaimed fiber fabrics mainly include fibers processed by chemical or physical methods such as waste plastic bottles and fishing nets. These fabrics not only reduce environmental pollution, but also realize the recycling of resources. The recycled fiber fabric has good air permeability, moisture absorption and comfort, and the production process is more environmentally friendly, with lower energy consumption and less pollution than the traditional synthetic fiber. In addition, recycled fiber fabrics also perform excellent in strength, durability and other aspects, which can meet the needs of different fashion products.

Microbial fiber fabric

Microbial fiber fabric, using microbial fermentation technology to produce fiber has the characteristics of environmental protection and low carbon. Microbial fiber fabric not only has the excellent performance of traditional natural fiber, but also has good biodegradability and low environmental load, which shows a broad application prospect in the field of clothing and home textile. For example, by controlling the fermentation conditions, the physicochemical properties of the fibers can be regulated to meet the functional requirements of different products. At the same time, microbial fiber fabric, can also be used together with other materials to improve its comprehensive performance such as enhancing mechanical strength, improve the feel and appearance and other characteristics. In addition, microbial fiber fabrics can also realize the recycling of waste water and waste gas in the production process, so as to further reduce environmental pollution and resource consumption.

Natural dye fabric

Natural dye fabrics have attracted wide attention for their environmental protection and pollution-free characteristics. The fabrics, derived from diverse sources, including plants, minerals and microorganisms, are extracted through traditional technology or modern technology. Natural dyes are not only rich in color and natural in color, but also have good biodegradability and low environmental impact. In addition, natural dye fabrics also have certain antibacterial, insect control and skin care functions, which enhance the added value of the fabric. However, natural dye fabrics also have some limitations, such as relatively low color fastness and high production costs, which limit their promotion in large-scale commercial applications. To overcome these limitations, researchers have been exploring new technologies in recent years to improve the stability and durability of natural dyes, and to reduce production costs.

Smart textile fabrics

Intelligent textile fabrics through integrated sensors, actuators and other electronic components, give traditional textile perception, reaction and the ability

to adapt to environmental changes, realize temperature regulation, health monitoring, energy collection, and other functions, provides a new dimension for sustainable fashion, not only prolong the service life of clothing, also promote the effective use of resources and the development of environmentally friendly products.

4 Case analysis of new fabrics in sustainable fashion

Biological based fiber fabrics including the use of corn starch, sugar cane and other renewable resources made of polylactic acid fiber in the application of the clothing design, and through the microbial fermentation technology of PHB fiber application in the field of shoe material and bags, in addition to the use of wood pulp, bamboo pulp and other natural plant fiber development of motor and Lessel fiber successful application in underwear and casual wear. These bio-based fiber fabrics not only have good comfort and air permeability, but also can significantly reduce the environmental pollution problems caused by the traditional oil-based synthetic fiber, reflecting the concept of sustainable fashion. Applications of recycled fiber fabrics include polyester fibers made of recycled plastic bottles, recycled cotton extracted from waste textiles, and products that chemically convert waste into cellulose fibers. These fabrics are widely used in clothing, footwear and accessories, not only reducing environmental pollution, but also reducing resource consumption, demonstrating the important role of recycled fiber fabrics in the sustainable fashion field. The application of microbial fiber fabric includes the application of cellulose fiber such as Lessel fiber produced by microbial fermentation technology, the production of fiber materials with special performance by bioengineering technology, and the specific application examples of microbial fiber in the fields of sportswear, underwear, home textile products and so on. These applications not only demonstrate the unique advantages of microbial fiber fabrics in improving wearing comfort and environmental performance, but also demonstrate their potential in promoting the fashion industry in a green and sustainable

direction. Natural dye fabric application cases including the use of plant and animal minerals and other natural materials dyeing practice, such as the use of mgrass, blueberries, pomegranate skin, turmeric plant extract natural dye dyeing of cotton linen silk fabrics, not only natural rich, and production process environmental pollution, at the same time using natural dye dyeing fabrics has good permeability and comfort, meet the requirements of sustainable fashion concept. Application of intelligent textile fabrics including intelligent temperature control clothing, health monitoring clothing, interactive clothing, etc., through the integration of sensors, conductive fibers and energy collection device, these fabrics can realize temperature regulation, physiological parameters monitoring and interaction with the environment, shows the intelligent textiles in improving wearing comfort, enhance functionality and expand the huge potential of the fashion boundary.

5 Advantages and limitations of new fabrics in sustainable fashion

New fabrics, with their excellent environmental attributes and multi-functional features, show unprecedented potential in the field of sustainable fashion. First, they significantly reduce their dependence on natural resources, and significantly reduce water consumption and greenhouse gas emissions in the production process through the efficient use of renewable materials and the recycling of waste materials. In particular, many new fabrics have excellent biodegradability and recycling capacity, effectively alleviating the ecological burden brought by the accumulation of traditional textile waste. In addition, these breakthroughs in the physical and mechanical properties of fabrics, such as high strength and wear resistance, coupled with excellent comfortable feel and breathable and perspiration function, make it an ideal choice for a healthy and energetic life. In addition, intelligent characteristics, such as photosensitive color change and self-cleaning, further broaden the application boundary to meet the needs of diversified life scenes.

However, the popularity of new fabrics is not without obstacles. High R & D

investment and relatively low productivity constitute the main cause of the high initial cost, which restricts the pace of marketization. The technical level is not mature, leading to some fabrics have not yet reached the standard of stable mass production, limiting the possibility of their wide application. At the same time, despite the public's growing awareness of environmental protection, the higher price of green products still affects consumers' willingness to accept them. The lack of an environmental impact assessment mechanism makes it difficult to accurately measure the true ecological benefits of the new fabrics. In addition, the complex and diversified supply chain system, the lack of unified standards between the links, and the poor collaborative efficiency, all set up many obstacles for the large-scale promotion of new fabrics.

Fabric innovation has undoubtedly become the core driving force to promote the green transformation of the fashion industry. On the one hand, through resource conservation and emission reduction measures, the environmental performance of the whole industrial chain is reconstructed, and the win-win situation of economic benefits and ecological benefits is achieved. On the other hand, the optimized production process significantly reduces energy consumption and waste output, and promotes the overall efficiency of the industry. More importantly, it improves the durability and recycling rate of products, extends the market life of commodities, fits the social trend of consumers' pursuit of green consumption, and enhances the environmental protection image and market competitive position of the brand. Therefore, the new fabric is not only the result of technological innovation, but also the embodiment of the responsibility of the fashion industry to meet the global challenges and lead the social fashion.

In short, despite multiple challenges, new fabrics are still seen as a key element in leading the transformation of the fashion industry into a sustainable development model.

6 New fabric development trend under the concept of sustainable fashion

The development of new fabrics has provided a strong impetus for the innovation of new fabrics, including nanotechnology, bioengineering technology and the research and development of intelligent materials. Through nanotechnology, fabrics with special functions can be developed, such as waterproof and breathable, antibacterial and deodorant characteristics. Bioengineering technology makes it possible to use microorganisms to produce fibers, such as the bio-based fibers produced through the fermentation process, which not only reduces the dependence on oil resources, but also reduces the environmental pollution. In addition, the development of smart textiles, such as temperature adjustment fabrics and induction fabrics, not only improves the comfort of wearing, but also expands the application scope of fabrics in wearable devices and other fields. These technological innovations not only enrich the types of new fabrics, but also provide more possibilities for the realization of the sustainable fashion concept. The innovation of new fabrics driven by market demand is mainly reflected in the increasing demand of consumers for environmentally friendly and healthy products, which puts forward higher requirements for new fabrics. Such as the requirements of fabric performance function diversification and the focus of fabric production process environmental enterprise to meet these needs, continuous technological innovation, to develop more new fabrics that meet the market demand, such as high-performance sports fabrics, antibacterial deodorant fabrics, biodegradable environmental protection fabrics to adapt to market changes and lead the consumption trend.

7 Conclusion

Main research findings summarizes the new fabric under the application of the concept of sustainable fashion status, advantages and limitations, and through specific case analysis shows the practical effect in the fashion industry, discusses the technology innovation, policies and regulations and market demand for the development of new fabrics, finally put forward Suggestions for the future research direction and look forward the

application prospect of new fabrics under the concept of sustainable fashion.

Facing the future, the academic and practical circles in the field of new fabrics need to focus on the following dimensions to deepen understanding and practice, in order to promote the comprehensive development of sustainable fashion.

1.Exploration of the relationship between environmental adaptability and human comfort: systematically study the specific performance of —— in various climate environments, including extreme high temperature, cold and frequent humidity changes, and its impact on human heat regulation function. This requires interdisciplinary integration of meteorological science, ergonomics and textile technology to reveal how the microstructure of the fabric affects the macro comfort experience, and then guide the customized development of fabrics to meet the needs of diverse climate groups.

2.Consumer psychology and behavior analysis: Using psychology and marketing theories to deeply explore the cognitive level, purchase motivation and acceptance barriers of sustainable fashion, identify the key factors shaping public preferences, and improve the penetration rate of environmental protection products with accurate strategies. Special attention is paid to the value change of the younger generation and the role of social media, to evaluate the mechanism of its attitude to the formation of emerging fabrics.

3. Environmental footprint fine accounting: establish a set of covering the whole life cycle of new fabric environmental impact assessment model, quantitative analysis from raw material extraction, processing to waste processing each stage of carbon footprint, water footprint and other important ecological indicators, provide decision makers based on facts of green purchasing guidance, and incentive fabric suppliers to improve process, reduce the ecological cost.

4. Comprehensive consideration of cost and benefit: Carry out economic research on the feasibility of large-scale industrial conversion of new fabrics, compare the

cost structure, profit model and investment return cycle of different technical routes, and identify the optimal implementation scheme. At the same time, considering the market expansion potential and price sensitivity, flexible price strategies are designed to promote technology transfer and commercial diffusion.

5. Construction of interdisciplinary cooperation network: strengthen in-depth exchanges among all sectors of industry, learning and research, break down information barriers, share scientific research achievements, and accelerate the speed of technological innovation. In particular, universities, research institutes and head enterprises have set up special research and development funds and set up open laboratories to overcome difficulties and create a win-win situation.

6. Market strategy from a global perspective: In view of the cultural differences and economic development level in different regions, carefully plan the promotion path of new fabrics in the international market, and tailor regional marketing plans. With the help of big data analysis tools, we can predict potential hot spots, optimize the allocation of resources, and enhance the international brand image and market share share.

In general, the above research direction is not only related to the progress of technology, but also related to the institutional structure, cultural concepts and even the adjustment of the global economic pattern. Only by adhering to the principle of innovation-driven, multi-party collaboration and continuous optimization, can we seize the first opportunity in the complex and changeable trend of The Times and create a bright future of sustainable fashion.

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