

Research on the Application of Leather Materials in Elderly Care Products

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Abstract: As the population ages to a peak, age-appropriate design has emerged and become a field of great interest. The kitchen, as a frequently used space, must consider the physiological and psychological needs of the elderly in its design, with material selection being particularly critical. Leather, with its unique texture and properties, can evoke special emotions in the elderly, making it highly suitable for the design of age-appropriate products. By deeply understanding the psychological and physiological characteristics of the elderly and incorporating leather into the shape and color design of cabinets, the quality of life for the elderly can be effectively enhanced.

Keywords: Elderly Care Products; Cupboard; Leather; Emotional Design.

1. Introduction

By mid-century, the aging population in our country will peak, with the proportion of people aged 65 and over approaching 30%. In response to this trend, the concept of age-friendly design has emerged. This design integrates Maslow's hierarchy of needs with emotional design, aiming to meet the emotional needs of the elderly. The core idea is to protect the health of the elderly and enhance their daily living comfort.

The kitchen is one of the most frequently used spaces in a household, but complex cooking activities can be a significant burden for elderly individuals living alone or those who need to care for their children's meals. Therefore, developing a product that meets the needs and physical conditions of the elderly can enhance their living comfort and safety, provide emotional support, and is crucial for their physical and mental health. In the design of kitchen cabinets, material selection is particularly important, as it not only affects the product's functionality and durability but also its appearance and feel[1]. Leather, with its unique texture and characteristics, can offer special emotional experiences to the elderly, such as its thickness and warmth. This article will explore the application of leather material characteristics in design from an emotional perspective, examine its use in age-friendly products, and provide a detailed discussion using age-friendly kitchen cabinets as an example.

2. Types and Characteristics of Leather

The history of leather is long and rich, originating from animal skins. Initially, people used these materials for basic protection against the cold, warmth, and to cover their bodies. Today, with the application of various technologies and techniques, the use of leather has expanded into numerous industries. In contemporary society, with growing environmental awareness and advancements in modern leather processing technology, leather products are primarily categorized into two types: natural leather and artificial leather.

2.1. Natural Leather

Natural leather, derived from animal skins, is also known as animal leather. After a series of processing treatments, it retains the original texture and fine structure of the animal skin, giving each piece of natural leather its unique appearance. Depending on the source of the raw material, natural leather can be categorized into various types, such as cowhide, sheepskin, pigskin, horsehide, snake hide, alligator hide, and camel hide. Based on surface treatment, it can be further divided into full-grain leather, dyed leather, suede, and split leather, among others[2]. In general, regardless of the type, natural leather is characterized by its soft and smooth texture, providing a comfortable feel. Additionally, natural leather has moisture absorption and breath-ability, which help regulate humidity and temperature, making it more comfortable to use. It also exhibits excellent flexibility and stretch-ability, adapting to various shapes and needs. Furthermore, its good wear resistance and tensile strength ensure that products made from natural leather are durable.

2.2. Artificial Leather

As the population grows, the demand for leather increases, and with growing environmental concerns, artificial leather has emerged. This plastic product closely mimics the appearance and feel of natural leather, aiming to replicate its look and performance. Although artificial leather closely resembles natural leather in appearance and touch, its durability falls short of that of animal leather. Its texture is typically regular, lacking the natural variations and uniqueness found in genuine leather. Moreover, artificial leather generally lacks breath-ability. However, one significant advantage of artificial leather is its malleability, allowing it to be crafted into various innovative patterns and colors according to the designer's creative vision.

3. Application of Leather in Design

Leather is a unique material with a long history of production, application, and development. Thanks to its softness, wear resistance, and distinctive visual and tactile qualities, leather has found increasing use in design. Designers, leveraging modern technology, skillfully integrate leather into various designs from multiple perspectives,

offering consumers unique emotional experiences. Through modern design techniques, beautiful meanings are conveyed, meeting the diverse emotional needs of people across different age groups.

In the realm of furniture design, the combination of leather and wood is extremely common. This combination can be categorized into two primary types: Firstly, leather, with its unique luster and warm, soft texture, is often used as a decorative material for furniture surfaces. Warm-toned woods and leather complement each other in color, both being delicate and smooth. However, the contrast between the softness of leather and the hardness of wood enhances the product's harmonious unity. Secondly, the elasticity of leather allows it to work seamlessly with metal and wooden components, ensuring the stability and comfort of the furniture. The close integration of leather's resilience with metal and wooden structures, through various fusion techniques, achieves a perfect blend of leather with the furniture's structure and function, highlighting the furniture's natural elegance and sophistication.

In the field of fashion design, the application of leather can be categorized into two main types. Firstly, leather is used as a core material. It offers a wide range of textures, from the smooth and delicate sheepskin to the robust and durable cowhide, each providing a unique tactile experience. The stiffness and resilience of leather give garments a distinct three-dimensional feel and clear lines. Moreover, the fine texture and luster of leather significantly enhance the overall quality of the garment. Secondly, leather is integrated into fashion design as a decorative element, adding a touch of unique charm and personality to the garments. By skillfully incorporating elements of traditional Chinese culture into leather clothing through modern technology, not only does it enhance the decorative effect, but it also boosts the cultural and market value of the products[3].

In the realm of shoe design, leather plays an indispensable role. It not only boasts numerous significant advantages but also offers a wide range of applications. Different types of leather can create a variety of styles and designs. By incorporating various patterns into the leather, shoes not only enhance their decorative appeal but also serve as a practical form of art [4]. Moreover, high-quality leather has excellent breath-ability, which helps keep the feet dry and reduces the feeling of stuffiness and dampness. The softness and elasticity of leather allow it to fit snugly around the foot, providing superior support and cushioning, effectively reducing foot fatigue. Additionally, the fine texture and luster of leather add a sense of luxury and refinement to the shoes.

In the field of interior design, leather is used in a wide variety of ways. It can be integrated with various decoration materials and also serves as an independent decorative element. Whether on walls, floors, or other areas, selecting leather that complements or contrasts with the overall space style can highlight its unique luster, creating a rich and diverse interior design style and giving the space a distinctive overall decorative effect.

4. Application of Leather in Products Suitable for the Elderly

For the elderly, when selecting materials, it is crucial to consider their specific needs for comfort, safety, and practicality. Leather, with its warm texture, perfectly meets these requirements. For instance, in designing clothing for the

elderly, leather products can provide waterproof and windproof features, effectively protecting against cold winds and keeping the body warm. The unique texture of leather not only provides a pleasant visual and tactile experience but also adds deeper decorative significance and auspicious, noble connotations through traditional patterns such as dragons and phoenixes symbolizing good fortune and peonies representing wealth and nobility. These meanings are conveyed through modern design techniques, satisfying the emotional needs of the elderly and creating a warm and comfortable environment. In shoe design, leather shoes, with their excellent flexibility and breath-ability, adapt to the special foot changes of the elderly, reducing issues like foot irritation and athlete's foot. In the design of elderly chairs, leather, with its softness and breath-ability, provides a comfortable sitting experience, alleviating discomfort from prolonged sitting. Therefore, leather is an ideal material for products designed for the elderly.

Furthermore, from a safety standpoint, leather can minimize injuries from accidental bumps. By replacing vulnerable areas with softer leather materials [5], this not only enhances safety but also boosts the product's aesthetic appeal and value, making life more convenient and comfortable for the elderly.

5. Design of Cabinets for the Elderly

In modern product design, the phenomenon of technical homogenization is very prominent, making product shape the core of design [6]. When designing kitchen cabinets, apart from objective factors such as space size, their shapes are often similar. However, the design of elderly-friendly kitchen cabinets must consider not only these external factors but also the physiological functions that may decline with age, such as slow movements, difficulty standing, bending, and limited joint mobility [7]. The design of elderly-friendly kitchen cabinets must fully consider the physical, psychological characteristics, and living needs of the elderly, aiming to provide a safe, convenient, and comfortable environment. During the design process, it is essential to thoroughly analyze the physiological, psychological, and lifestyle needs of the elderly, considering multiple dimensions to ensure that the designed kitchen cabinets truly meet the needs of the elderly.

5.1. Shape

Considering the physiological characteristics of the elderly, it is essential to carefully design the height of kitchen cabinets. Based on the physical dimensions and usage habits of the elderly, ergonomic dimensions for the cabinets should be established. When designing, ensure that the elderly do not need to make large reaching movements when retrieving items, and avoid excessive bending or squatting to reduce physical strain, achieve a balanced workload, and prevent overexertion of specific limbs[8]. Additionally, to meet the personalized emotional needs of the elderly for age-friendly cabinets, the overall design of the cabinet, including the door, body, and handles, should be considered. In the design of age-friendly cabinets, the use of curves is more favored by the elderly than straight lines, as curves provide a sense of psychological security and enhance the safety of their daily lives.

5.2. Color

Colors can influence the psychological, perceptual, and

behavioral changes in older adults. As they age, the decline in physiological functions leads to a gradual decrease in their visual perception. Therefore, enhancing the visual perception of older adults is a critical consideration in designing kitchen cabinets for the elderly. To cater to the visual characteristics of older adults, the colors of kitchen cabinets should have a clear hierarchy and be easily distinguishable between different functional areas. When selecting colors, it is advisable to use similar and warm tones to create a cozy atmosphere and reduce the sense of loneliness among older adults.

5.3. The Use of Leather in the Elderly Cabinet

Material, a key factor in the appearance of kitchen cabinets, significantly influences the overall display effect. Different materials used in cabinet design can produce vastly different effects. Modern leather, with its warm texture, always makes people want to touch it. Whether natural or artificial, the natural patterns and rich colors of modern leather endow it with unique artistic qualities, making it a perfect blend of visual and tactile functions, and the undisputed best material choice in visual texture design[9]. Unlike the cold and hard textures of metal or plastic, the softness of leather conveys a warm and comfortable atmosphere. When people touch leather, the soft and elastic sensation quickly reaches the brain, triggering a pleasant neural response[10]. In cabinet design, incorporating leather elements through various processing techniques such as sewing and weaving, whether in shape design or color selection, can add a unique design sense and visual impact, thereby significantly enhancing the product's value.

When designing age-friendly cabinets, the versatility of leather in shaping is highly appreciated. It can be crafted into handles, adding a unique texture and decorative appeal to the cabinet. The soft and smooth feel of leather meets the elderly's desire for a pleasant mood and comfortable experience during use. By decorating the cabinet doors or adding leather strips along the edges and specific areas, the aesthetic appeal and refinement are enhanced, thereby improving the quality of life for the elderly. Some side panels of the cabinets are wrapped in leather, which not only elevates the overall appearance and visual appeal but also helps the elderly affirm their self-worth. Most importantly, the corners of the cabinets that are prone to collision are covered with leather, which not only protects the cabinet doors from impact but also reduces noise when opening and closing, thus minimizing the risk of injury to the elderly.

In the color design of elderly-friendly cabinets, the unique colors of leather provide a rich visual and tactile experience for modern furniture decoration, with a broader range of material expressiveness [11]. When selecting leather colors, it is important to consider the preferences and needs of the elderly, choosing leather materials with different colors, textures, and shapes to achieve personalized decorative effects and create a comfortable visual experience. The selection of leather colors should align with the overall color scheme and the cabinet's tone. It is recommended to use light and warm-toned leather for the cabinet door surfaces, handles, and partial decorations of the cabinet doors. This warm and bright color can bring a sense of warmth to the elderly, effectively reducing their psychological stress and alleviating

feelings of loneliness in daily life.

6. Conclusion

The application of leather materials in various design fields is growing, and people's interest and affection for them are steadily increasing. As the aging population grows, the demand for kitchen cabinets has become more stringent. Designers must consider the special functional requirements and aesthetic preferences of the elderly, skillfully using leather materials to create age-friendly cabinets that are emotionally supportive. In these designs, the integration of leather with other materials infuses emotional needs into the design, making the appearance and color of the cabinets more personalized due to the addition of leather elements. Additionally, such designs enable the creation of age-friendly cabinets that are both safe and easy to identify, thus meeting the physiological comfort and emotional needs of the elderly during use.

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References

- [1] Z.X.Wang., Application Study of Leather Materials in Industrial Design . Shoes Technology and Design. 2023, 3(18): 128-130.
- [2] S.Qian,Exploring the Integration of Traditional Leather Craftsmanship with Modern Library Space Design.Leadership Science and Engineering. 2024, 34(06): 136-137.
- [3] G.Yan,Innovative Application of Canton Embroidery Pattern in Fashion Leather Clothing Design.Leadership Science and Engineering.2024,34(06): 112-119.
- [4] X.B.Ren,The Application of Patterns in Footwear Design.. Leadership Science and Engineering. 2021, 31(04):66-68.
- [5] L.Y.Yang , Research on the Application of Leather in Custom Whole House Furniture Design.Leadership Manufacture and Environmental Technology.2021,2(20):26-27+30.
- [6] SH.Q.Xie , W. Lin, Research on Innovative Design of Whole Kitchen Cabinets Based on the Concept of Aging Appropriateness. Art & Life-Journal of Fuzhou University (Art).2022,(04):24-29.
- [7] D.CH.Fu , H.R.Wang, Y.Pan, The Aesthetic Expression and Application Practice of Leather Furniture in Interior Design .West Leadership.2023,45(07):124-125.
- [8] Y.SH.Cheng , X.Q.Xu , B. Li, Design Strategies for Aging-in-Place Cabinets Based on the Life Patterns of the Elderly. Journal of Xiamen University of Technology. 2022,30 (02): 29-35.
- [9] L.ZH.Zheng,The Application of Modern Leather and Traditional Woodcarving in Furniture Design .West Leadership. 2021, 34(13):41-43.
- [10] XI.Chen,The Application of Leather Materials in the Design of Modern Furniture Products.West Leadership.2024,46(10):80-82.
- [11] P.Ma ,Aesthetic Study of Leather Materials in Urban Furniture Decoration.China Leadership.2022, 51(07):139-141.