

The Art of Sitting: From Materials to Functionality, Exploring the Diverse Charms of Renowned Seat Designs

Jingshang Huang^{1,a,*}

¹Department of Industrial Design and Packaging, Faculty of Management and Humanization Technologies, Belarusian State Technical University, Minsk, Belarus

^a1425760175@qq.com

*Corresponding author

Abstract: The chair is the most basic of all human household objects, ordinary but extraordinary, and it has been loved and redesigned by countless masters over the past century. This paper first discusses the categorization of seats in terms of both raw materials and functions, then summarizes several classic examples of modern chair design and analyses them from an ergonomic perspective.

Keywords: Chairs design, modern design, ergonomics

1. Introduction

In the long river of human civilization, as a bridge connecting people and space, the seat not only carries the practical function of rest and communication but also epitomizes the aesthetics of the times, the development of science and technology, and the fusion of culture. From ancient times to the present, the design of seats has evolved continuously, from the initial simple stone stool and wooden chair to today's integration of high-tech and the art of the modern seat; each design is cohesive with the wisdom and craftsmanship of designers. In this article, we will discuss the classification of chairs and their design concepts from the dimensions of raw material selection and functional characteristics and take you into several world-renowned chair designs to feel how they meet the basic needs while interpreting the "art of sitting" with their unique forms, materials, and functions.

Through a detailed analysis of the seat's raw materials- natural and straightforward solid wood, light and strong metal, or soft and comfortable fabrics and leather- the choice of each material reflects the designer's consideration of durability, comfort, and environmental protection concepts. In terms of function, from essential support and adjustment to convenient operation with the integration of intelligent technology, the design of seats tends to meet more and more personalized and diversified needs.

Subsequently, we focus our attention on several classic chair designs, which are either simple and uncomplicated or innovative and break through tradition. These designs not only lead the trend of seat design but also become symbols of the spirit of the times. These designs not only show the creativity and talent of designers but also deeply reflect the changes in social culture, technological progress, and aesthetic trends.

2. Classification of Chairs by Material

Wooden material, a traditional and popular choice in chair making, is known for its excellent durability and high adaptability in home decoration. This natural material gives designers endless creative space, making every piece of furniture a unique work of art. Among the diversity of wood, it is not difficult to find that the color changes from light to deep, to the delicate to rough texture display, and the unique hardness differences all add rich layers and personality to wooden chairs.

Oak is particularly worthy of mention, as it stands out among the many wood species and has become the leader in furniture manufacturing. The hardness of oak is just proper. It is neither too hard to be processed nor easily deformed by external factors, ensuring the stability and durability of the furniture structure. Therefore, oak chairs can win widespread favor and praise for their unique charm and quality, whether in a classical and elegant home environment or a modern and simple design space.

Metal material also plays an important role in the field of chair manufacturing. It enriches the language of furniture design with its unique charm. This type of material covers steel's toughness, copper's elegance, and aluminum's lightness. Each meets the needs of different occasions and styles with excellent performance characteristics. The significant advantage of metal materials lies in their extraordinary strength, which can withstand greater pressure and weight, ensuring the stability and safety of the furniture structure [1].

In addition, metal is easy to process and shape, allowing designers to flexibly realize various complex design concepts, from smooth lines to fine patterns, all showing the beauty of metal craftsmanship. Even more commendable is that metal chairs are inherently waterproof and fireproof. They can maintain their original beauty and functionality even in humid or high-temperature environments, making them an indispensable element in modern home styles [2]. The simple lines and cool texture of the metal chair fit in with the simple design concept of contemporary space and add a unique touch of scenery to the home environment with its unique sense of modernity.

As a trend that cannot be ignored, plastic chairs have quietly emerged and quickly occupied a place in the chair market, especially in baby chairs, dining chairs, and other market segments. Made of plastic, these chairs cleverly combine many advantages into one, making them the preferred companion for modern life.

First, plastic chairs are lightweight, making them particularly convenient to move and carry, which greatly improves their flexibility and convenience of use. Second, the rich color choices of plastic materials bring unlimited creative space to chair design, satisfying the pursuit of personalization and beauty by different groups of people.

In addition, plastic chairs are tough and can maintain a stable shape even when subjected to a certain amount of pressure or external force. They are not easily deformed or damaged, ensuring safety and durability. Some plastic chairs also have excellent light transmission properties, allowing natural light to travel freely indoors, creating a warm and bright space atmosphere.

Fabric material chairs, such as office chairs, sofas, and living room chairs, are frequently used in home and office spaces. Their unique charm lies in their perfect fit to the curves of the human body, creating unparalleled softness and comfort and excellent waterproof performance, making them ideal for daily use. More peace of mind. However, it is worth noting that this characteristic of fabric material also requires us to give more care and maintenance while enjoying the comfortable experience it brings. Since the surface of fabrics easily absorbs dust, regular cleaning and maintenance are particularly important.

Leather material is a high-end choice in the field of chair manufacturing. Its excellence is reflected in its comfortable sitting feeling, elegant aesthetics, and excellent anti-fouling performance. Compared with ordinary blended materials that are colorful but have limited durability, the selected high-quality first-layer leather chairs have become a model of the coexistence of durability and luxury with their extraordinary durability and wear resistance. Not only are these chairs comfortable to sit on, but their delicate texture and elegant appearance add an unrepeatable sense of high-end to your home space. And their excellent anti-fouling properties make daily maintenance easy and simple.

The Rattan chair, a unique piece of furniture, comes from the careful weaving of thick rattan, including the clever entanglement of rattan skin, rattan core, and rattan, thus creating the simplicity of the rattan stool, the elegance of the rattan armchair and the elegance of the rattan chair. Solemn and other forms. Its weaving materials, exquisite craftsmanship, and profound cultural heritage are all deeply rooted in the traditional crafts of Southeast Asia, giving the rattan chair an ancient and charming southern sentiment. Although it does not deliberately pursue a modern style, it is precisely because of this Won the favor of middle-aged people.

The charm of the rattan chair lies in the extraordinary interest contained in its simplicity and the ultimate pursuit of artistry in its shape and design. From the traditional Chinese elements of the peacock's tail to the elegant crown of European and American palace styles and the infinitely creative geometric shapes, the rattan chair shows artistic fusion across cultures with its changeable shapes. Even more amazing is that almost all rattan furniture can provide personalized customization services. Whether it is size, style, or style, it can be tailor-made according to customers' needs. This also makes the styles of rattan furniture rich and diverse, satisfying customers' needs. Reflect the aesthetic preferences of different groups of people.

3. Classification of Chairs by Function

Modern dining chair design primarily pursues simplicity and comfort to fit modern home aesthetics. Its design lines are streamlined and smooth, and it abandons complicated decoration to create a refreshing visual experience, making people feel relaxed and comfortable. At the same time, comfort is the cornerstone of the design, and ergonomic principles are used to shape the chair back and seat curves to ensure adequate support for the waist and back. With comfortable materials and moderate hardness, dining time is more relaxed.

In addition, functionality plays a vital role in designing modern dining chairs to adapt to the needs of fast-paced life. The design often incorporates storage and folding elements, aiming at space optimization and flexible use. The folding design facilitates storage and transportation, meeting daily convenience, and integrating storage functions, such as adding tableware storage space, further enhances the practicality of the dining chair.

Compared with ordinary chairs, children's study chairs adopt a scientific and reasonable design, which can effectively adjust people's posture and prevent bad habits such as hunchback and rounded shoulders, allowing students to study in the correct posture, thereby avoiding and improving spine and joint problems. Disease. The design of the study chair pays attention to ergonomics, making its seat, backrest, armrests, headrest, etc., very close to the human body, which can effectively relieve the fatigue caused by long-term study and make students more focused and comfortable [3]. The study chair uses advanced materials and technology, reducing students' fatigue and improving learning efficiency. For example, some study chairs are also equipped with a tabletop that can be adjusted up and down, allowing students to adjust the height of the tabletop according to different learning needs and habits to improve learning efficiency.

The core design concept of office chairs is to integrate ergonomics, aiming to create an office environment for users that supports the spine and ensures a comfortable sitting posture. This design philosophy is reflected in many details, such as the carefully constructed backrest system, which integrates waist and head support functions, effectively dispersing and reducing the pressure on the spine caused by long-term sitting [4]. In addition, the office chair also allows users to adjust the seat height, backrest tilt angle, and even the height and angle of the armrests according to personal preferences, thereby further improving personalized comfort experience and support effects.

Regarding material selection, office chairs pursue high quality and durability, using wear-resistant and easy-to-clean seat fabrics paired with sturdy metal or reinforced plastic structural components and filling materials that provide superior support. It is particularly worth mentioning that the backrest material is durable and has good breathability, which can effectively promote air circulation, reduce sweat accumulation, and provide users with a dry and comfortable sitting feeling.

Office chairs also perform well in terms of stability and flexibility. Its stable base design combined with smoothly rotating wheels ensures stable support during work and makes it easy for users to move when needed, meeting diverse office needs.

Leisure chairs are furniture designed to make people relax, so their comfort is essential. The leisure chair adopts an ergonomic design that allows people to maintain a relaxed and comfortable feeling during long periods of sitting. The seats and backrests of leisure chairs are generally made of soft materials, such as foam and cotton, to provide people with the best comfort. The design of leisure chairs is very diverse to adapt to different usage needs and personalized aesthetic requirements. Modern leisure chairs are usually divided into hanging baskets, rocking chairs, lazy sofas, and other types. You can choose the appropriate leisure chair according to different spaces and uses. Lounge chairs are used for a long time, so durability is essential. Good leisure chairs usually use high-quality materials, such as solid wood, steel, aluminum alloy, etc., with stable structure, strong load-bearing capacity, and long life. In addition to being practical and comfortable, leisure chairs must have a certain degree of aesthetics. The design of the leisure chair should meet people's aesthetic requirements, and proper consideration can be given to matching it with other furniture to make the layout of the entire room more coordinated and unified.

Lounge chairs can effectively relieve people's physical pressure. In daily work and living environments, such as sitting in the office or on the sofa at home for long periods, the human body often suffers from long-term pressure from the spine and neck, fatigue, and instability. The emergence of the recliner is precisely to alleviate this situation. It has just begun to promote the body's overall relaxation and effectively induce fatigue [5].

Lying on a recliner of the proposed design, one can experience physical relaxation outside the body.

This sense of relaxation is not limited to the physical level. Still, it goes deep into the soul, helping to relieve inner stress and anxiety and guiding people into a calmer and more peaceful state.

For those who love reading, a recliner is a rare good companion. First of all, compared to traditional sofas, recliners provide better comfort and support when reading. Users can adjust the height and tilt angle of the recliner according to their personal preferences to ensure that they can enjoy reading in the most comfortable position, whether they are flipping through books or browsing magazines, with ease and comfort.

Folding chairs are known for their lightness, greatly facilitating people's handling and carrying needs. They can be quickly and easily folded into a compact size, which is convenient for storage at home and suitable for carrying with you to outdoor activities. This chair has extremely high space utilization and takes up almost no extra space in its folded form, making it a practical choice for home and travel. Folding chairs show diversity and flexibility in design, coming in various shapes and sizes to meet the needs of different occasions.

In terms of materials, folding chairs also provide a wealth of choices, including, but not limited to, metal, wood, plastic, and other materials. Metal folding chairs have become a popular choice for outdoor use due to their durability and resistance to oxidation and corrosion, while plastic folding chairs have become popular in-home environments due to their lightweight, portable, and easy-maintenance features. They are extremely practical.

In addition, the folding chair's design pursues simplicity and efficiency. It has a clear structure and a smooth folding and unfolding process without complicated operating steps, which is very convenient for users.

Modern massage chairs incorporate intelligent design concepts and integrate advanced chip and sensor technology, which can accurately sense the user's weight, height, and body shape characteristics and automatically adjust the massage intensity and seat layout accordingly to ensure that every massage is perfect. Accurately fits individual needs, bringing unprecedented comfort and personalized experience. These massage chairs are equipped with various massage programs, covering kneading, percussion, massage, acupressure, and other techniques, each designed to meet the preferences of different people and specific massage needs. For example, the kneading mode is specially designed for people with tight muscles and can effectively relieve stiffness. In contrast, the tapping mode significantly improves blood circulation and promotes metabolism and is especially suitable for people with poor circulation.

In addition, modern massage chairs also have significant fatigue-relieving effects. They act on muscle tissue through fine massage techniques, relieving muscle tension and fatigue. At the same time, they accelerate the metabolic process in the body, optimize blood circulation, reduce microcirculation disorders and other problems, and promote good health [6]. Not only that, they have also become a powerful assistant in promoting sleep and relaxation. Massages can help users reduce physical and mental stress and quickly enter a deep sleep state through the dual relaxation of body and mind. In daily use, the pleasant massage experience provided by the massage chair dramatically improves the comfort of people's lives.

The hanging basket chair, as a seat that combines comfort and versatility, is widely used in various indoor and outdoor spaces, including but not limited to the living room, the private corner of the bedroom, the bright spot of the balcony, and even the quiet corner of the garden. Add a touch of comfort and relaxation to people's leisure time. Similarly, in leisure consumption places such as cafes and bars, hanging basket chairs create an ideal environment for customers to enjoy a high-quality leisure experience with unique charm.

The highlight of its exquisite design is that the hanging basket chair can incorporate a dynamic swaying feeling into the static sitting posture. This subtle experience makes people feel more comfortable and can effectively dispel tension and deepen the sense of relaxation. The seat adopts a thoughtful arc-shaped structure that accurately fits the curves of the human body, providing more stable and comfortable support for the body. Its sturdy bracket structure ensures it is as stable as a mountain even when carrying weight, giving users a complete sense of security.

4. Modern Design Solutions of Chairs

In modern furniture design, seating is not only practical furniture but also a combination of art and function. In this section, we will discuss several representative chairs, including the Cassina 635 Red and

Blue Chair, Lockheed Chair, "Z" Chair, Eames Lounge Chair, Panton Chair, and Allen Office Chair. These chairs are not only unique in design but also demonstrate different concepts and practices in terms of comfort and ergonomics. By analyzing the design background and characteristics of these classic chairs, we can have a deeper understanding of the evolution and development of modern furniture design.

4.1. The Cassina 635 Red and Blue lounge chair

In the field of non-ergonomic seating, the Cassina 635 Red and Blue lounge chair was designed by the famous Dutch architect and designer Gerrit Thomas Rietveld between 1917 and 1918. It is one of the most creative classics in the history of Western modern art design in the 20th century. This Chair is made of wood, made of machine-made wood strips and laminates. Its most notable feature is that 13 wood strips are perpendicular to each other, forming the basic spatial structure of the Chair. This design breaks the traditional way of furniture construction [7]. The structures are fastened with screws instead of traditional mortise and tenon joints. This ensures the stability of the structure and avoids damaging the integrity of the components.

From an ergonomic point of view, although the structural design of the Red and Blue Chair is unique, it does not fully meet the requirements of human comfort. The geometric shape of the Chair is relatively radical, lacking the curved support of traditional chairs for the human body.

4.2. The Lockheed Chair

The Lockheed Chair was designed by the famous designer Marc Newson in 1986 while he was still studying at Sydney College of the Arts. The Chair is based on the concept of "creating a flowing metal form" and is inspired by 18th-century carriage seats, which are transformed and innovated through modern materials and processes.

The Lockheed Chair is known for its unique sense of flow and artistic beauty, but it may be lacking in ergonomic support. Traditional office chairs or leisure chairs are usually designed with backrests and cushions that conform to the curves of the human body to provide support for the waist and back, reducing discomfort caused by long-term sitting. However, the streamlined design and lightweight materials of the Lockheed Chair may not provide enough support for users, especially in the waist and back areas. This may lead to waist soreness or back discomfort after long-term use [8].

4.3. The "Z"-shaped Chair

The "Z"-shaped chair is a work by the famous Dutch designer Gerrit Thomas Rietveld in 1934. The legs, seat, and backrest of this Chair are all free from the shape of traditional chairs, which is very space-saving. The entire Chair divides a whole template into 4 pieces and then uses mortise and tenon, glue, and bolts to withstand pressure.

The design of the "Z"-shaped Chair often pursues simplicity and fashion, but it may be insufficient in terms of lumbar support. The waist is one of the parts of the human body that needs to be supported when sitting. Lack of sufficient support can cause fatigue and discomfort in the waist.

4.4. The Eames Lounge Chair

The Eames lounge chair was designed by Charles and Ray Eames in 1956. It is actually composed of three parts: the headrest, backrest, and seat. Each part is made of five layers of plywood and two layers of Brazilian mahogany veneer. The armrests are creatively made of shock-absorbing pads. This lounge chair has had a huge impact on the development of furniture design in various fields.

The Eames lounge chair fits the body curve: The design of the Eames lounge chair fully considers the natural curve of the human body when resting. The backrest and seat can perfectly fit the user's body and provide excellent comfort [9].

4.5. The Panton Chair

The Panton Chair is a classic modernist furniture design, developed by Danish designer Verner Panton in the late 1950s and early 1960s. This Chair occupies an important position in the history of modern furniture with its unique design and revolutionary manufacturing process.

The Chair is usually made of high-quality materials such as polypropylene, which are not only lightweight but also resistant to heavy pressure and UV, ensuring the durability and stability of the Chair [10].

Panton chairs are not only suitable for office spaces but are also widely used in a variety of environments, such as homes, libraries, and museums, proving the versatility and comfort of their design.

4.6. The Aeron Office Chair

The Aeron office chair is a "balanced" office chair launched by Donald Chadwick and William Stumpf in cooperation with the company. It is a well-designed office chair that highly fits the natural form of the human body, and its design fully embodies the principles of ergonomics. The designer set out to create a chair that "metaphorically represents the human body in both visual and tactile terms." This is the Aeron office chair, whose curvaceous biomorphic structure is perfectly suited to the contours of the human body. What's more surprising is that the Aeron chair does not have any cushions attached and relies entirely on its own shape to provide support and comfort.

The backrest and lumbar support of the Aeron office chair strictly follow the natural curvature of the human spine. Users only need to lean on the backrest, and the backrest and lumbar support can provide just the right support for the spine, helping users to easily maintain normal spinal curvature and reduce fatigue caused by sitting for a long time.

The Aeron office chair fully considers the principles of ergonomics in the design of the backrest and waist support, seat design, armrest design, tilt and rotation functions, and overall stability and durability. These design features make the Aeron office chair highly consistent with the natural form of the human body and meet the best comfort of human activities.

5. Conclusions

Through the detailed classification and in-depth analysis of seating from raw materials to functions, we appreciate the diversity and richness of seating design and the humanistic care and the spirit of the times behind the design. From the initial pursuit of essential practical functions to today's focus on the comfort experience, environmental protection concepts, and cultural heritage of all-around consideration, the development of seat design witnessed the continuous progress of human society and civilization.

By exploring these classic chairs, we can see that modern furniture design's balance between aesthetics and functionality continues to evolve. From the innovative structure of the Cassina 635 Red and Blue Chair to the ergonomic design of the Allen Office Chair, each Chair reflects the designer's pursuit of comfort and artistry within the context of its time. These designs enhance the quality of people's daily lives and promote continuous development and innovation in furniture design. Therefore, an in-depth study of the design concepts and practices of these chairs helps us better appreciate their artistic value and provides valuable reference and inspiration for future furniture design.

Looking into the future, with the rapid development of science and technology and the continuous change of human lifestyle, seating design will usher in a broader space for innovation and development opportunities. We have reason to believe that the future seat design will continue to lead the aesthetic trend and lifestyle innovation while meeting the needs of personalization, intelligence, and greening so that the art of "sitting" will bloom more brilliantly in the interweaving of time and space.

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