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Exploring the Application of New Materials and Processes in the Design of Intelligent Medical Beds

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Abstract

With the continuous progress of science and technology, new materials and new processes have brought new opportunities and challenges to the field of intelligent medical bed design. The emergence of each new material and new process will promote the reform and innovation of intelligent medical bed design, and with the continuous improvement of the design level of intelligent medical bed, it will be accompanied by the emergence of more new materials and new processes. In this context, through comprehensive analysis of existing literature and cases, this paper deeply understands the classification of new materials and new processes and their practical applications in the design of intelligent medical beds. These applications drive improved product performance, improved user experience, and sustainable design. Through the summary and induction of the research results, it will provide valuable references and suggestions for smart medical bed design practitioners, and promote the improvement of the level of smart medical bed design and the promotion of innovation.

Keywords: Intelligent Medical Beds; New materials; New technologies

Introduction

As a discipline closely related to manufacturing, technology and innovation, smart medical bed design constantly pursues innovation and breakthroughs to meet people's changing needs for

products. In this evolving field, the application of new materials and new processes has become an important factor in promoting the progress of smart medical bed design. However, although the new materials and new processes have great potential in theory, they still face some challenges and limitations in practical applications. Therefore, in-depth research and exploration of the application of new materials and new processes in smart medical bed design not only helps to understand their advantages and limitations, but also provides practical guidance and experience sharing for smart medical bed design practitioners.

1 Application of new materials in intelligent medical bed design

1.1 Classification and development of new materials

In the design of intelligent medical bed, the application of new materials plays a crucial role in the innovation and development of products. New materials refer to materials with new characteristics developed on the basis of original materials through chemical synthesis, physical modification or material combination. These materials often have higher properties, a wider range of applications, and more potential for innovation than traditional materials. According to the composition of the material, new materials can be divided into the following categories.

The first is new metal materials, which refers to materials with innovative properties and characteristics that appear in the field of metal materials. They usually achieve performance improvement and innovation by changing the composition, microstructure and processing technology of the metal. Mainly high strength steel, shape memory alloy, superalloy and so on.

The second is new ceramic materials, which refer to materials with innovative properties and characteristics that appear in the field of ceramic materials. Compared with traditional ceramics, the new ceramics have higher strength, hardness, wear resistance and high temperature resistance. There are mainly oxide ceramics and nitride ceramics.

The third is new polymer materials, which refer to materials with innovative properties and characteristics that appear in the field of polymer materials. Compared with traditional polymers, the new polymer has higher strength, heat resistance, chemical resistance and plasticity. There are mainly high performance polymers and biodegradable polymers.

The fourth is nanomaterials, nanomaterials refer to materials with nanoscale dimensions. The special structure and properties of nanomaterials give them unique functions, such as high strength and high conductivity. In smart medical bed design, nanomaterials are often used to enhance the performance and function of products, such as nanocoatings, nanoparticles, etc.

The fifth is biodegradable materials, which is a class of materials that can decompose and degrade in the natural environment, such as bio-based polymers, PLA (polylactic acid), PHA (polyhydroxyl fatty acid ester), etc. These materials are environmentally friendly and do not produce persistent pollution, so they are widely used in many fields.

The application of new materials in the design of smart medical beds benefits from their unique

properties. These characteristics not only promote the improvement of product performance, but also promote the innovation and development of smart medical bed design. First, the lightweight nature of the new material allows the product to reduce weight, improve transportation efficiency and energy utilization. At the same time, its high strength and corrosion resistance contribute to the lightweight of the structure and improve the compression resistance of the product. In addition, the heat and thermal conductivity of the new material can maintain the stability of the material at high temperatures and adapt to the needs of a variety of industrial applications. Plasticity is another important property that allows the new material to flexibly meet the requirements of various shapes and structures, enabling personalized smart medical bed designs. The improvement of wear resistance and durability extends the service life of the product and keeps the appearance of the product beautiful [1].

The development of new materials presents a series of important trends that drive innovation and progress in smart medical bed design. First of all, multi-functionalization has become the key direction of the development of new materials, which must not only have a single performance characteristics, but also be able to realize the comprehensive application of multiple functions. Secondly, environmental friendliness is an important pursuit of the development of new materials, focusing on the economical use of resources, degradation performance and recycling, in order to reduce the negative impact on the environment. High performance is also the main goal of the development of new materials, the pursuit of higher strength, lower density, better thermal conductivity and other indicators to meet the continuous improvement of material performance requirements of intelligent medical bed design.

1.2 Application research of new materials

With the progress of science and technology and the change of industrial demand, the continuous emergence and application of new materials have promoted the innovation and development of intelligent medical bed design. On the one hand, the properties of the new material have had a profound impact on the design of smart medical beds. The lightweight characteristics of new materials are of great significance for the design of automotive, aerospace and other fields, which can not only reduce energy consumption and environmental pollution, but also improve the performance and competitiveness of products. At the same time, the high strength and corrosion resistance of the new material determines that it is widely used in the construction field, and the use of new materials such as high-strength steel and aluminum alloy can reduce the use of building materials and improve the stability and safety of the building structure. In addition, in the design of electronic products, the use of materials with excellent thermal conductivity can improve the heat dissipation performance of products, improve the efficiency and life of electronic equipment. Plasticity provides more possibilities for the appearance design and functional layout of products. Improvements in wear resistance and durability extend the service life of products and are particularly important in areas such as consumer durables and outdoor equipment.

On the other hand, the application of new materials in the design of intelligent medical beds also needs to be comprehensively considered from the point of view of design. Smart medical bed design emphasizes product functionality, aesthetics and ergonomics, and the application of new materials can meet these needs. For example, high-performance plastics have excellent mechanical and thermal properties in product design, which can achieve lightweight and durable products. This is essential for the design of home appliances, electronic products and other fields. The versatility of new materials allows designers to integrate more creativity and functions into product design to meet the diverse needs of users. For example, with new materials that are highly malleable, designers can create a more curvy and streamlined product appearance, enhancing the aesthetic value of the product and the user experience. In addition, the color, texture and gloss of the new material also provide designers with more choices and expression space, so that the product can be matched with the user's aesthetic taste. In addition, the new materials can also be combined with other process technologies, such as 3D printing, laser cutting, etc., to bring more possibilities and flexibility to product design. Through the proper use of new materials, designers can create more innovative and unique products, enhance market competitiveness and user experience

2. Application of new technology in intelligent medical bed design

2.1 Classification and development of new processes

New technology refers to the process of product manufacturing and processing, using new technologies, processes and methods to achieve product innovation, function enhancement or performance improvement. The introduction of new processes can change the production method, material application, process flow, etc., to achieve higher efficiency, quality and innovation. The development of new processes means breakthroughs and improvements to traditional processes, bringing more possibilities and competitive advantages to smart medical bed design through the use of advanced materials, equipment and technology. The new process covers many fields and technologies, which are mainly summarized as new adding process, new forming process, new joining process and new surface treatment process.

New addition process refers to the addition of specific substances or the use of special process technologies to raw materials in the manufacturing process to change the properties of materials and increase the function of products. For example, add nanoparticles, add reinforcement materials and so on. This process can realize the effect of strengthening, modifying and functionalizing the material. The new molding process is a process in which the material is heated, cooled and pressurized to change from one shape to another. This includes thermoforming, injection molding, pressure molding, etc. The molding process can realize the production of complex shapes and improve the precision and quality of products. The new connection process

is the process of connecting two or more parts or materials together to form a whole product. Common joining processes include welding, gluing, threading, etc. The development of the connection process makes the product structure more stable and improves the reliability and service life of the product. The new surface treatment process is to coat, coating, polishing and other treatments on the surface of the product to improve the appearance of the product and improve corrosion resistance and wear resistance. Common surface treatment processes include electroplating, spraying, oxidation and so on. The surface treatment process can give products different textures and colors, increasing their market appeal.

The application of the new technology in the design of intelligent medical bed has several remarkable characteristics. First of all, by introducing advanced technology and equipment, the new process can realize the automation, intelligence and efficiency of the production process, and improve production efficiency and capacity. Secondly, by using advanced control and measurement technology, the new process enables higher precision and quality control, ensuring product consistency and stability. Third, the use of low-energy, low-pollution processes and materials, the new process reduces the negative impact on the environment, in line with the requirements of sustainable development. Finally, through the introduction of new materials, processes and methods, the new process can achieve product innovation, function enhancement or performance improvement, bringing more possibilities and competitive advantages to the design of smart medical beds

The development of new technology is in the stage of continuous evolution, and its development trend is mainly concentrated in the following aspects. First of all, through the application of digital design, simulation and virtual reality technology, the product development and production process is highly integrated and intelligent. This digital manufacturing can improve production efficiency and quality control capabilities, bringing greater flexibility and innovation to smart medical bed design. Secondly, 3D printing technology as a rapid prototyping technology is developing rapidly, bringing disruptive changes to the traditional manufacturing industry. It can realize the rapid manufacturing of complex shaped products, save materials and energy, and provide convenience for personalized customization and small batch production, bringing more possibilities for smart medical bed design. In addition, intelligent manufacturing has also become an important direction for the development of new processes, through the application of technologies such as the Internet of Things, artificial intelligence and big data, the interconnection and automatic control of equipment are realized, and the flexibility, reliability and adaptive ability of the production line are improved.

2.2 Application research of new technology

The application of the new technology has a wide application prospect in the field of intelligent medical bed design. First, the application of new processes in the product design phase helps designers achieve a higher level of creativity and design flexibility. Through digital manufacturing

and 3D printing technology, designers can quickly produce conceptual models and prototypes to achieve rapid verification and iterative design. This significantly shortens the product development cycle, while also providing more innovation possibilities. At the same time, the application of virtual reality technology enables designers to simulate and experience the appearance, function and user experience of products in the virtual environment, and further optimize the design scheme. Secondly, the application of the new process in the manufacturing stage of the product supports the realization of efficient, accurate and reliable production processes. The application of intelligent manufacturing and automation technology enables the production line to achieve automation and intelligent control, improve production efficiency and quality stability. For example, the application of robotics can achieve precise assembly and high-speed processing of complex parts, reduce human error, and improve product consistency and accuracy. In addition, the new process can also optimize the process flow and material selection, achieve the reduction of production costs and effective use of resources, and improve the economy and sustainability of production.

In addition, the new process also provides the possibility for the functional expansion of products, such as in the field of smart home, through the application of the Internet of Things and sensor technology, products can achieve remote control, intelligent interaction and automated management, providing a more convenient, comfortable and intelligent life experience. Finally, the application of new processes in sustainable design is also reflected in the efficient use of resources and energy conservation. By optimizing the process flow and material selection, the new process can reduce energy consumption and waste emissions. For example, using advanced manufacturing technologies and renewable energy supply chains, smart medical bed designs can achieve efficient use of energy and a reduced carbon footprint. At the same time, the new process also encourages the application of sustainable materials, such as the use of recyclable materials, recycled materials and biodegradable materials, in order to reduce the dependence on limited resources and environmental damage. This feature greatly promotes the disassembly of the product and the separation of the material, making the parts and materials of the product more convenient to be recycled and reused. This helps reduce waste generation and reduces pressure on natural resources.

3. Establishment of intelligent medical bed design materials and process database

In the field of intelligent medical bed design, it is very important to establish a material and process database. Such a database can provide designers with a wealth of material and process options to help them make more informed decisions and optimize the product design process. The material database includes the physical properties, chemical properties, mechanical properties and other information of various materials, while the process database contains the principle, characteristics, application scope and other information of various production processes. First,

building a material and process database can improve the efficiency and accuracy of designers. Through the search and filtering capabilities of the database, designers can quickly find the material and process options that meet the requirements of the project. This saves a lot of time and effort, while also reducing the risk of trial and error. Designers can make informed choices based on reliable database information to ensure the feasibility and optimization of products in terms of materials and processes. Second, building a material and process database can also help improve design quality and product performance. By systematically documenting and comparing different materials and processes, designers can better understand their properties and scope of application. This enables designers to select the best combination of materials and processes according to the requirements and objectives of the product to achieve the optimization of the product in terms of appearance, function and performance. The database can also provide prediction and simulation analysis of material and process properties to help designers evaluate and optimize product performance at the design stage. In addition, the establishment of the material and process database also provides the basis for the cooperation of the industrial chain. Designers, manufacturers and suppliers can share information from the database to enhance communication and collaboration. This helps to better coordinate design needs and production capacity, improve production efficiency and quality control of products. The database can also provide reference to relevant standards and specifications to ensure product compliance and sustainability.

4 Conclusions

The application of new materials and new processes in the design of intelligent medical beds has brought unlimited innovation possibilities to social production. Through the continuous development and application of new materials, it is possible to design lighter, stronger and more environmentally friendly products. At the same time, the introduction of new processes makes the manufacturing process of products more efficient and precise, and promotes the realization of sustainable design. These innovations lead to a better user experience, higher productivity and more sustainable development. In the future, it is foreseeable that the application of new materials and new processes in the design of smart medical beds will continue to expand. With the continuous emergence of scientific and technological progress and innovation, we will see the emergence of more new materials, as well as the development of more advanced and smarter process technologies.