



BIONIKA CONCEPT FOR DESIGN OF FURNITURE

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Abstract: The design represents the outward appearance of a product or subject. The design is what makes the products attractive, beautiful and desirable, and has a significant impact on sales of the product and enhancing its commercial and artistic value.

The main conditions that a design must meet to individuality and uniqueness, as well as its features to not only have technical function, but also have artistic value.

Bionics is a tool for expression in the design of furniture, or a way to explore the similarities in animate and inanimate nature for further use of the established principles of construction and operation of biological systems and their elements to improve the existing technical systems, creating new functional forms-furniture.

Keywords | Key phrases

Design, bionics, aesthetics, furniture, architecture, urbanism

INTRODUCTION

Designers and innovators are constantly looking for inspiration to create new designs. One source of inspiration is nature. Examples from nature and inspiration from natural forms that surround us daily were solutions to create a lot of designs, both in the past and today. Designers have used natural forms, compile, and mechanisms applied in many designs. In the world of industrial design natural forms were not visible in the past, but today there are serious attempts to use nature as inspiration for design - bionics, innovation inspired by nature.

That is the subject of the environment which man makes as imitation of forms from nature, and any creation of such a product of nature is characterized by striking suitability, reliability, durability, efficiency in various shapes and designs.

In 1995, the American scientist Jackie Style introduces the word "bionics" to express the symbiosis between nature and technology. This is an original interpretation of bionics, which stems from the terms "organic" and "technology". But Jackie Steele believes in the principle of "learning from nature", so bionics are defined as learning from nature.

This principle is commonly used by various specialized sciences such as mathematics, engineering and architecture. It basically determines the way of investigating living systems with analytical criteria in order to find better solutions to human needs.

Bionics is not science, but a method in which man should implement their imagination with an understanding of how and why things work in nature.

Bionics explains all shapes representing the imitation of forms from nature. One of the main reasons why bionics is more popular today is that man finally has the tools and skills to analyses the nature and learn from her many processes.

Bionics in furniture design

In recent year's bionics gained popularity, so that more and more seen as a model

and touchstone. Millions of years of evolution in nature and mechanisms produce compositions that are very effective, avoid waste and sustainable in almost closed system.

Bionics can be defined as the study of the shape, structure and function of biological materials and manufactured articles, and biological mechanisms and processes, in order to create products which are nature imitation. The field of bionics is interdisciplinary and covers the study of biological functions, structures and laws of nature, which are studied by biologists, chemists and other scientists.

By studying successful solutions in nature, to solve many human problems in the field of design and construction products. This way of designing and thinking can be defined as an innovation inspired by nature. The possible extinction of many animal and plant species and knowledge of the environment in humans began to develop abstract thinking and it allows them to create forms based on their application and possibilities of materials for their realization.

Shaping the facilities it is largely determined by the technological characteristics of its creation, the organization that defines the outer shape of rhythm or repetition. Its rhythmic organization of form created by man makes an external manifestation of the internal structure, obtained by specific technological research. So rhythmic organization of form created by man, makes an external manifestation of the internal structure derived from certain technological research.

The inspiration for the development of new technologies is at the core of the approach of bionics. Great diversity of biological forms allows certain attributes to be used as inspiration for innovative design solutions. Insects, plants and animals daily engineers and teachers with a lot of knowledge. They are a whole system that works and is all around us.

Nature is a big secret for the man, and each of his understanding of the system is a big step. The specific stage of development of forms of wildlife that not only formal aspects of wildlife and established connections between the laws of nature and development of the design concept.



Figure 1. Bionics

The more man comes close to nature, the chance of survival is bigger. The inspiration of the designers did not just wake up the forms in nature, but also the processes and survival of living organisms. Today, more and more people seek to

understand the nature and seize all its graces and transforming its forms and processes in its designs that facilitate human life.

Bionics place slowly finds in the design, in terms of shape and materials of design decisions. While the methodology for complex imitation of nature in respect to the structure, processes and functions in the future more and more will be developed.

The furniture industry has many examples that are created on the principle of bionics. Furniture, lighting fittings, decorations and other items that are natural forms such as bird nests, leaves, spider webs, flowers. At this stage designers do not use external forms of wildlife, but only those properties and characteristics of forms that reflect the function of a particular organism. That is the function to form within the laws - this is the main way of bionics design.

New Bionic inspired aesthetics of lighting in interior design is not achieved only by imitating natural forms, but by imitating the natural process of bioluminescence, a natural chemical phenomenon by which organisms living deep in the seas, and certain types of



fungi, bacteria, insects and worms, produce light to survive in the hostile and dark environment.

The most important phase of the work of the designer is the study of the wildlife.

The main method is functional bio design - analogous comparative principles and means for shaping the design and wildlife.

Bionic research on the properties of the materials is particularly important for the design. According to the principle called "lotus effect" characteristic of the lotus leaf, thanks to the discovery that microscopic lumps covered with a layer of wax reject water droplets and also removes dirt out, designed a fabric and "Lotus" coloured properties of refusing water and self-cleaning. These materials have high potential for use in interior design. I.e. analysis of natural form designer tries

In the arrangement of the internal spaces and interesting bionics inspired discoveries of several materials, such as anti-microbial material that mimics the structure of the skin of Galapagos sharks; fabric "Morforex" made by imitating the morphology of the wings of butterflies, a mixture of nylon and polyester whose shining colors and cannot



fade; bio-plastic derived from the shells of crabs and CO2 technology that mimics the metabolism of plants; strong adhesives and adhesive materials "Geckskin" that can hold objects weighing up to 317 kilograms attached to oily wall, inspired by the lizard legs.

In addition aesthetic and functional values, bionic designs have both environmental and economic value. Today, more and more attention is paid to such

properties of designs and designers strive to create environmentally friendly designs.

These few examples of designs inspired by nature, mainly used in the design of interiors, and although a bit numerous and not sophisticated enough, unlike other areas where applied bionics, however clearly show the extent to which bionics can and should serve as a basis for further development of interior design.

Given the wide scope, as well as its aesthetic, functional, environmental and economic values bionic design promises great achievements in the future of humanity and change the former understanding of technology, industry and design.

Designs inspired by nature in function of design furniture

Over millions of years of continuous evolution, nature has perfected solutions to many of the questions posed by modern engineers, architects and designers. But perhaps now, the most intriguing question is how the integration of bionic discoveries can transform into practice? The easiest way may be considered a direct imitation of nature, but this is often difficult or even impossible. Nevertheless, studies have found that it is more reasonable to understand the principles of how things work in nature, rather than running copying natural models. They make analysis of natural form and determine its tectonics and thus develop harmony with well-defined laws and principles. Perception and acceptance of harmony make structural models or images of natural form requires some transformations.

Bionic design is an innovative approach in which the nature and natural processes requires inspiration to create products, processes and facilities that it's functional design challenges are resolved by devising and applying natural strategies, methods and principles. The method of functional organic design analogies. Application of bionics in the design of the system wakes creative thinking, makes you think, look, and apply the laws of nature. Bionics is widely used in the design. Such use occurs in two ways - borrowing purely external form and machine construction, furniture created based on the laws peaking in nature.

In bionics seeks to answer more questions, for example: how nature solves the problem of insulation, nature reduces friction as nature stifling noise like nature solves the problem of moisture, such as nature collects energy, nature collects water and many other issues which man tries to find them and to make life easier. Bionic approach aims to create a design that is not only visually appealing and elegant but also functional. The design- solution can be bionic in terms of shape, material, structure, process or function.

These products meet constantly and particularly noticeable in the field of architecture. Broadest range of furniture has inspired precisely by natural forms, and as such is used in all kinds of interior and exterior. The transformation of natural forms provides an opportunity for designers to combine different shapes, colors, textures.

The shape of the shells is inspiring form, and often meets as a transformation into some sort of furniture, and even architecture. This form provides an opportunity for designers to create interesting shapes to suit multiple purposes. There are elegant line and fits into any space. Starting with sofas, shelves, chairs, armchairs, sinks and other parts of the interior, the shape of the shell is found in whole architecture. Such objects have an internal space that can be adjusted in an interesting living space, and the outer appearance is unusual and interesting.

This interesting area furniture inspired by the shell can be combined and the interior and exterior solutions. It can fit multiple styles of arrangement, and give emphasis on space.



Figure 4. Shelves inspired by the shape of the shell

Finding inspiration in the form of a shell, the designers have created interesting designs with a different purpose. In this way, through different designs, industrial products available are closer to nature, mimicking its forms, processes, materials. But except furniture, the shape of the shell was inspiring for architects who created the interesting architecture.



Figure 5. Architectural objects inspired by the shape of the shell

Beautiful, unique and irreplaceable form, the shell is one of the most perfect designs of nature. It was inspiring long ago. Primitive civilizations made drinking vessels and vases shaped shell. Later in the Greco-Roman period they were created domes, spiral staircases and decorations on the walls in the form of a shell. At the time of rococo one of the main features of this style was the decoration in the form of shell. Today inspiration of this form is seen in the design of furniture, decorative objects and architectural objects.

Conclusion

Over the years, many designers and architects seeking funds to assist in the process of creating new harmonic forms. With the development of technology, the discovery of new materials and improved conditions for new designs, new forms and interesting solutions. Today, a very important feature is the ecological value of the

products produced. Man tries more and more to adapt to nature, and to create a healthy environment. Many design solutions, architectural structures, industrial products, furniture and materials are created by transformation of natural forms and processes.

Expected inspiration from nature to contribute to the improvement of technology and its impact and be felt in all spheres of life. Some designs may seem impossible performance today, but more and more improving human understanding of nature and improve skills so that in future all designs to be realized. Design forms arising from the development of the creative process of shaping the laws of nature - it is not the forms of nature and synthesis of natural forms and means that available to a designer.

Process modelling in bio-design includes systematic study of natural forms and geometric analysis of their fundamentals. In this process, there is usually a incredible precision with which nature makes calculations of ideal geometry, although sometimes it is hidden and difficult to distinguish. However, by consciously learning, feeling great and open soul, designers can find inspiration in such research.

Living systems are very different and complex technical designs. It should be borne in mind that biological form often cannot be calculated because there is extraordinary complexity. The secret of the structure of living organisms occur in them details of the life processes, the structure and operation can be found only with modern equipment.

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