

## Physical and Formal Equilibrium in Furniture

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### Abstract:

Balance is an essential element in furniture design that is overlooked by many, despite its utmost importance, because of its design dimensions, and security and safety dimensions.

The skill of formal design balance in design is an integral part of the design process as it is the basis upon which the components that determine the aesthetics of design in relation to the function, where it is possible to do a balanced design work based on new and non-typical foundations and achieve durability and strength, where the creative designer invents new designs. It is atypical in shape as it addresses the irrational to bring out a new way out on the eye, in addition to adhering to the design standards during design and with achieving the indispensable balance in all types of different designs and their fields.

As for the physical equilibrium, it must be represented in the field of furniture on specific bases and criteria. The designer can produce the best furniture designs that achieve the principle of the required physical equilibrium, but without the routine use of the usual thought, which shows the prestigious effect of the concept of true equilibrium, which shows the new balanced innovative models in the field of design Furniture.

Balance is employed as an essential element in the design process in order to obtain the job that achieves user comfort while achieving strength and durability in the design. Balance is important and necessary for the integration of furniture, as it plays an important role in the aesthetics of composition or design, achieving a sense of psychological comfort. The interior designer has a desire to produce balanced furniture. Nature is the source of man's learning how to achieve balance, and man uses it in the matters of his life.

Criteria for evaluating design and physical balance after the design process includes understanding and analyzing the balance approach in furniture and then clarifying the level of balance included and done through Autodesk Inventor 2017, a program for making mechanical designs and conducting tests.

### Therefore, the research aims to:

-Knowing the formal design equilibrium and the physical equilibrium in furniture, as they are part of furniture design that evokes new designs and opens new horizons. Where we can better understand how to achieve it and the problems associated with its solutions, to reach the rules that must be followed when designing balanced furniture.

-Furniture design needs to use the skills of the interior designer to make it better for the user, and given the huge developments in the field of technology, and the need to take advantage of modern technologies in the development of furniture design methods, which contributed to achieving intellectual flexibility in design that was impossible to achieve through traditional media. It can be implemented regardless of its complexity, so the concept of balance appeared in the furniture.

-In reference to the importance of formal and physical equilibrium in furniture, the research clarifies this concept, as it depends on proper application, so the research clarifies and analyzes it, to reach the state of equilibrium it aims at.

### **Keywords:**

(The Concept of Furniture, Design Balance, Physical Equilibrium)

### **The Introduction:**

The formal design and physical balance is the basis of the design process of furniture in terms of functionality and visual vision of the eye, because it is one of the most important foundations of design that are indispensable in designing furniture, as each stage of the design process includes a comprehensive follow-up to the basis of balance, as it depends on the designer's vision of places Weakness and strength in the design and then proceed towards the design of a balanced piece of furniture despite its unusual shape, which includes innovations and design innovations.

Physical balance in furniture design is one of the most important foundations that achieve functional comfort in terms of durability, even if the design suggests otherwise. Hence, the designer's ideas begin to succeed, as he creates a design that suggests weakness, but is more durable and strong. Achieving balance in furniture pieces needs to The element it achieves in the piece may be hidden or visible but it does its job as a balancing point that makes the whole design balanced.

### **Research Problem: The Research Problem Is Represented In:**

Lack of attention and following the foundations of physical balance in the field of furniture, where there are shortcomings in the design process for some new designs with attention to the external form and neglecting the durability and strength that it achieves in the design.

- Some furniture designs suffer from physical imbalance due to the lack of studies and lack of familiarity with sound design methods, where the design itself is the source of the problem.

### **Therefore, the research seeks to answer the following question:**

- How to employ the physical-physical balance as an important basis in the design process in the field of furniture and as a rich source to open new creative horizons?

### **Research Objectives: The main objectives of the research are:**

- Shed light on the physical equilibrium as a basic source in the design process and the problems related to it in the design of furniture.

Awareness of physical physical balance to increase the link between it and the designer's awareness of furniture design, so that we can better understand how to achieve it and the problems associated with its solutions, to reach the conditions that must be followed when designing furniture that is balanced in form and material.

Providing designs for balanced pieces of furniture that have a visual, plastic and functional value, which is an opening for renewal and innovation in the field of furniture, and to get out of the stereotypical design space in the design movement and understanding balance.

### **The importance of research:**

- "Guidance to the development of physical balance in furniture" and finding a scientific method. The research calls for:

Achieving the link between “design and physical equilibrium” in furniture, as furniture is a rich source of creativity, and the production of innovative designs bearing the concept of equilibrium in design in terms of form, function and design movement.

With the designer's innovation and good study, and focus on strength and durability that achieve balance.

- Increasing design awareness and achieving the term "design and physical balance in furniture" in every design in the field of furniture.
- Acquaintance with the technology, materials and modern methods used in how to make balanced furniture, which appears in the analysis of furniture pieces.

**Research hypothesis: It answers the question of the research problem:**

Employing physical equilibrium as an essential element in the design process in order to obtain the function that achieves user comfort while achieving strength and durability in the design.

Using the concept of physical and design equilibrium as a source of creativity, following the design principles and standards, and acquiring skills in designing furniture to be an addition in developing design solutions to achieve balanced furniture.

**Research Methodology:**

The research follows the descriptive analytical approach: to describe and analyze the “physical and design balance in the furniture” in question, and through descriptive and analytical studies of some designs implemented for furniture pieces according to the balance in the furniture, as well as in building research tools “procedures” from questionnaires.

It also follows the applied approach: to verify the hypothesis of the research through the application of physical and formal equilibrium on pieces of furniture designed by the researcher, and to evaluate the proposed designs and models, and through applied studies taken from the research results, as well as the questionnaire designed by the researcher.

**Search Limits:**

To prove the research hypothesis and achieve its objectives, the research is determined in a study:

- Physical and formal equilibrium in furniture design decision-making and problems related to furniture design as a creative source that serves the field of interior design.
- Presenting designs for some pieces of furniture that serve and carry the concept of balance in furniture by clarifying different ideas for pieces of furniture.

Time limits: The research study addresses the current period (21st century AD).

Spatial limits: depend on the application of physical and formal equilibrium in the furniture of some different facilities.

**Search procedures:**

The researcher prepared a questionnaire to verify the feasibility of integrating physical and formal balance in furniture design and to judge the proposed designs as follows:

The questionnaire to know the opinions of specialists from the faculty members of the Department of Interior Design and Furniture at the Faculty of Applied Arts, Helwan University,

Damietta, Banha, Beni Suef, October 6 University and the Higher Institute of Applied Arts October 6, and the questionnaire consists of a table containing (6) phrases.

Research sample: - A sample of interior design and furniture specialists (20 doctors).

Research axes: To achieve the goal of the research and answer the questions of the study and to prove its hypothesis through the proposed methodology, the research includes the following axes:

**First: Theoretical framework:** “Furniture as an element of interior design – the concept of design and physical equilibrium – physical and design equilibrium in furniture.”

**Second: Applied Analytical Framework:**

- It includes the analysis of some models executed for pieces of furniture that bear the concept of physical and formal equilibrium and a complete analysis based on the concept of equilibrium in design.

- Follow the applied analysis of some pieces of furniture designed by the researcher in an analysis that serves the concept of balance.

## Findings and Recommendations:

### First, the results:

Through the study carried out by the researcher, he obtained a set of results for specialists and students in the field of furniture, which are summarized as follows:

- 1- The balance (physical and formal) that the research adopts, is an essential element in furniture design, because of its design dimensions, and dimensions of security and safety. Functional beauty The balance between the form and function in which it is used and suited, and the focus on strength and durability that achieve balance is achieved.
- 2- Benefiting from physical and formal equilibrium in furniture design is to achieve functionality and achieve an innovative form, and focus on strength and durability that achieve equilibrium, and it can be used to enrich design thought, and this is evident in the design group “application framework” for some pieces of furniture designed by the researcher, Which illustrates the prestigious effect of the concept of true balance, which shows the new innovative models balanced in the field of furniture design.
- 3- To design various pieces of furniture that are physically and design balanced, it is necessary to identify the technology, materials and modern methods (the apparent factors affecting the physical level of balance), which are used in how to make balanced furniture, to help the designer in designing various and appropriate pieces of furniture to meet the changing needs of users.
- 4- Employing balance in furniture during study and directing education to its development, which enables us to better understand how to achieve balance, and to reach the rules that must be followed when designing balanced furniture.
- 5- Imposing balance tests in factories during the furniture production process works to verify the balance and safety of the product on the individual, and to realize the importance and danger of balance.
- 6- Programs to evaluate balance criteria after the design process, important programs that must be applied in the interior design and furniture departments, to evaluate the work of balanced mechanical design, which ensures understanding and analysis of the design balance approach in furniture, then clarifying the level of balance. Like Autodesk Inventor 2017, to test and

simulate designs, while studying and testing the mechanism within a safe and efficient environment.

### **Second: Recommendations:**

The theoretical and practical study through the research resulted in a set of results, which determine the results of balance in furniture. Through research, study and results, a set of recommendations can be put forward:

1- Take advantage of the "physical and formal" balance in designing furniture that carries, serves and achieves the concept of balance, represented in achieving functionality and innovative non-traditional shape, and can be used to enrich design thought.

2- Balance in furniture must be represented on specific bases and standards. When connecting them, (furniture) with aesthetic, plastic and functional value is produced, and new innovative designs bearing the concept of balance are produced.

3- Acquaintance with technology, materials and modern methods (the apparent factors affecting the physical level of balance), which help the designer in designing various balanced and appropriate pieces of furniture to meet the changing needs of users.

4- Realizing the importance and danger of the "physical and formal" element, and imposing balance tests in factories during the furniture production process works to verify the balance and safety of the product on the individual, because of its design dimensions, and security and safety dimensions.

5- Employing balance in furniture during study and directing education to develop it as an essential element in the design process, and as a rich creative source that opens new creative horizons that serve the field of interior design in the Department of Interior Design and Furniture, to enable us to better understand how to achieve balance and its problems, and to reach the rules that must be followed when Do a balanced furniture design.

6- Academic bodies for design education should use equilibrium evaluation programs after the design process, such as Autodesk Inventor 2017, which is one of the important programs that must be applied in interior design and furniture departments, as it ensures understanding and analysis of the design balance approach in furniture, then Clarify the level of equilibrium included.

The recommendations are only two points: Imposing balance tests on any piece of furniture that is produced. Teaching computer programs that help the designer to study the extent to which balance is achieved during the design process

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