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INNOVATIVE DESIGN SOLUTIONS TO ACHIEVE MOVEMENT IN JEWELRY

Gadah Abdul-Aziz Binduhem
Princess Norahbent Abdurrahman University, SAUDI ARABIA
gadah.duhem@gmail.com

ABSTRACT

The research aims to emphasize on the movement as artistic value in itself, and what can achieve from the enjoyment of the senses and psychological response, through finding innovative design solutions to achieve movement in jewelry based on data and technical possibilities of the times to take advantage of the possibilities of the computer as a tool to help the development of creative ability. Which revealed locomotors rhythm systems of the building design for the contemporary jewelry, through the study of the technical and structural principles based on philosophical thought and aesthetic of the actual movement as artistic value in itself, through the representation of movement and complex motifs and techniques that are difficult to be represented by traditional methods. To reach the objectives of the research the researcher used the descriptive analytical method for the detection of systems of rhythmic movement in building design for jewelry, as well as relying on the experimental method to validate the hypothesis, the research has been limited to the structural analysis of a sample of anthologies of jewelry, where the researcher dealt with the concept of movement and aesthetic dimensions and associated measures of actual movement and the most important categories in the art. The research concluded that it can find a variety of design solutions associated with the movement in modern art and postmodernism. One of the main recommendations of the research is that made use of animated programs in the field of jewelry and the curriculum and training should include some of the principles and the general concepts of rhythm locomotors systems and software that help achieve movement within the virtual environment.

Keywords: Movement, Construction, Design, Jewellery.

INTRODUCTION

The executed design by using raw metal for one of modulation techniques**,** and through which it can emphasize the aesthetic and artistic values as well as utilitarian function, or doing things of purely aesthetic purposes, among which is the three-dimensional stereoscopic, two-dimensional flat,that characterized by rhythmic systems of movement, whether natural or mechanism, which that have been implemented by techniques and new multiple methods. Where the minerals artist deal with it in line with the nature of the modern era, due the appearance of the machine and the multiplicity of formulations and the abundance of raw materials and experimentation in it so as to reach the best since they can offer of solutions in the field of contemporary jewelry

design and to develop them in form and content to keep pace with the modern age and its techniques.

RESEARCH PROBLEM

What is the possibility to reach innovative design solutions to achieve movement in jewelry?

THEORETICAL FRAMEWORK

The study revolves around two important axes, the first is the concept of movement and types it contained and its association to the design and the relation of such to the building design, and the second is the concept of movement in the of the art and jewelry and its relationship to the structural design of the jewelry.

Important Terms

1. Movement: "Linguistically against stillness" (Manzoor: 429), Philosophy and psychology defined as: "the science of the study of the forces causing the temporal and spatial relations" (Atiyah, 2001: 13), it is intended to move the research topic, the actual motion is adopted by a group of designers as a value associated with different variables for the specified period.
2. Construction design: Is one of the constructional methods used to design artwork, when the artist considering use of constructional method during the dialogue with the plastic raw materials and during parts assembly, particulars and units consisting the fine artwork, it passes a series of special activities of manner of construction, including, for example, the juxtaposition, inlay, assembly and overlay" (Boldwin, 1963: 27). It is the system of structural elements of jewelry used in any configuration that organized to build relationships to constitute the design of the foundations of aesthetic plastic, that vary according to system building elements in a certain frame, which specifies how rich jewelry and differentiate from the other piece.
3. Jewelry: It is the jewelry made of precious or non-precious metals and it has multiple functions and purposes for which it has been made for, to achieve many purposes, whether philosophical, social, or for the purpose of the exercise and decorations. The intention by jewels on the subject of the study is that the metal pieces made of precious metals and non-precious.

The First Axis: The Nature of the Movement in the Design

Movement is a vital and essential theme in science where it is known in physics as the transmission of the body from one place to another as a result of force or influential forces, and these laws in various sciences are formulas for those tunes, they are the foundations provide the art with the realism information and fictional interpretations.

And here lies the face of the kinship between the movement in the nature and indication and meaning of the movement in art, which constitutes the rhythmic, such balance or harmony cannot be achieved in the physical world which is full of continuous motion, however, it is achievable in artwork, this is because, "Art is a poise beyond time, it is integrated creativity possess the movement underlying in life and that is because the movement in art is subject to constant law, a law associated of life laws, every authentic art has an genius capable of detecting and highlighting the drafting the law." (Dewey, 1963: 215).

As "the movement in the design must be subjected to a certain rhythm, the erosion of movement means the erosion of the conflicting forces, because the movement of the shape is a movement to infinity, because the movement renews itself and start all over again" (Halim 1972: 23), the movement may derives itself from some source or it be the source, the concept of movement in contemporary art has been changed getting advantages of scientific theories in the production of its art to form a technical dimension with the nested depth between kinesiology and aesthetics. The actual movement in three dimensions have been classified to:

- Design movement.
- Place of the design movement.
- Movement of the design recipient.
- Movement of place of the design recipient.
- The movement of the space limitations of the design.

So researcher dealt with the movement in design and its impact on the building design of the jewelry and its components and the most important technical schools that take advantage of the movement as the value of art adding dimensions and infinite possibilities of aesthetics which identified in this research in elastic bodies (Three-dimensional).

Movement in Flexible Bodies

Is three-dimensional works that occupy beat of space with real dimension and actual movement, since the jewelry consisting of a mass of metal or rock may take the form of different dimensions to perform a particular function, in addition, the Fine Arts in the postmodernism and contemporary era has allowed to scenes the positive role of effective participation and the creation of variables within the artwork, until the role of the scenes become a part of the concerns of the artist at the inception of his artistic work, and some of these works carried out in way making their parts are subject to change and move by scenes, what allows to modify forms, colors and artistic work relations according to the vision scenes, which providing an opportunity to issue aesthetic judgments and developing his independent sense, and he is no longer just the recipients of the work of art as much as he has become an active participant in the show.

Some artwork entered in a real dialogue with the scenes, it affects and is affected by him, they are variable depending on the position of the scenes, and with the participation of scenes the movement is realized or influence by the movement through his sense of them as it moves around, or through reflective surfaces inside the work, which reflect the outer sphere, including the scenes itself, the artist "Hans Mac" confirms the role of scenes by his saying; "My artworks can consider scenes as necessary source of energy to it." (Bazzaz, 1998: 16).

With the technical development new elements have been entered, such as light and the actual movement, the scenes no longer can identifies a static image on the composition of the artwork, so that he has to put the prospects for the next move, and to imagine the variables that can rise inside the work, the introduction of new sensory stimuli, such as the use of sounds with varying degrees higher degree sometimes in noise degrees and the use of clouds of smoke, beside the visual and texture stimuli, has its impact in the field of the use of more interaction between the viewer and the artwork, to the extent that make the word show, inadequate to express the new reality to recognize the work of art, which is approaching cohabitation or participate sensual work, surpassing the concept of visual viewing only, the artist Luther confirms that by saying: "My work is no longer just plates, but turned into devices and machines have allowed greater opportunities for the viewer to be used and continues through to deal with them more than just theoretical and non theoretical viewing experiences, and remembers the relationship between vision and thought." (Hussein, 2003: 25), and by such enabled modern artwork for the viewer as follows:

- Practical participation and dialogue, and issuing aesthetic judgments.
- Thought provoking by what it presents of experiences and information.
- Provoking conscience by what it sends of petition of amazement and wonder and anticipation surprise.

"The space deal reflects to us the importance of the imaginary ability and the ability to fix a mental picture and transport it physically to be a fixed presumption reality to determine the place at which the body will stabilize and its surroundings have been identified by assumptions restricted its place." (Bazzaz, 1998: 16). One of the important points for changing which often affect the aesthetics of the jewelry and the difficulty of determining the mental image of the surrounding bodies, especially in the ornaments which are subject to change and renewal, according to the method used and that we can overcome them through the embodiment of the work by multiple computer programs before implementation in an attempt to avoid some of the weaknesses and support the strengths when designing jewelry, the natural measurements of the movement is based on the scientific laws in mathematics, engineering, physics, and other effects resulting from the work of art and design in three dimensions,where the factors that influenced the design subject to the three elements, namely – light, distance and human.

Thus, the system design in the general body for jewelry received by human in parts or whole from multiple angles, here lies the ability of the designer and his ability to move the elements of jewelry design in and around the body, it is different outputs in the movement status of the body and the type of movement, "if the movement is totally it

gives complementary results with the space, other than the results resulting from the movement of the body part or parts thereof" (Bazzaz, 1998: 13), we therefore concluded that the cluster of jewelry give a different aesthetic values in the case of full or partial movement. Where "the interaction of the modern artist with those correlated images is a positive interaction, became more sense to time, particles, motion, order, and more belief that the usual apparent is not only the crossing point for the truth of things" (Hussein, 2003: 26), the core fact is the most important, which led to the emergence of the movement in the several systems linked to the basic components of morphological and functional body jewelry in our search current theme.

The Impact of Actual Movement on the Body Shape

The body shape is affected when organizing a group of actual movements at the same time as it produce certain forms with special characteristic body and it is like meanings in the music, it has become a movement of regularity to the loss of regularity, let us take a simple example of this, "Suppose we suspended (Two Pendulums) of different length from one fulcrum, we find that whenever we are mod them together towards a specific destination and then left them, it is noted something strange as the short pendulum starts swing faster from the long pendulum, then quickly differs from the pendulum with less motion, and whenever continued to swing they return to regularity in the movement, then they simply lose regularity again and immediately we realize the formal system of this volatility in the movement (Bazzaz, 1998: 190).

This example illustrates two types of body movement in them and these bodies can become very complicated whenever we organized several different movements with each other, which give us the movement of vehicles affect the overall shape of the body during movement. Among the most important dimensions of the actual movement is its impact on our understanding of the body shape, which can be illustrated as follows: "Imagine we draw the figure (8) on a circular disk that can be rotated, when the figure begins its rotation it gains a strange formal flexibility, as shows like writhing on the amebic cell, and many of the moving formations represent animated virtual volumes may be concrete in degree that can be photographed with them." (Scott 1951: 191), we conclude from this that the movement of the recipient or the design itself occur "impact on the formal qualities of the appearance of the general body for design compared to the situation of stillness." (Bazzaz, 1998: 37), and can take advantage of this feature when designing systems of locomotors rhythm in the jewelry and the extent of its effect on body shape.

The Second Axis: The Evolution of the Concept of Movement in Design

The time for an artist and writer, is the practice exercise, not theoretical idea, artist faces a time when he wants to express, and when he wants to express things that are part of it, or elements that the time enter as key element in determining its existence. However, the artist draws his thought to this fact begin only at the beginning of the second half of the eighteenth century, when the German critic wrote, his book *Leasing*, in which he discusses the boundaries between art photography and poetry, where he touched on the problem of time in the Fine Arts, and the key question he

raised is: How, and to what extent, it can overcome the Fine Arts on the element of time? Therefore by enabling to emerge the movement, which is an extension in time, although its by its nature are rigid works in the place." (Ismail, 1974: 207). By these observations he draws the attention to the movement, where the designer can partially and gradually overcome this problem, he has tried to portray the chronology in a set of images to simulate the successive moments of the event with the independence of each image, i.e. each image has been mere expression of a particular moment of time from the chronology, as in ancient Egyptian art, and also it has been used by artists of the thirteenth century, Italians in the filming of religious tales until the end of the nineteenth century and the beginning of the twentieth century. The efforts of photographers and sculptors of that period ended to this extent to overcome the element of time, and the people throughout the that ages incline by the idea of motion extended in time, through the frozen moment represented by painting or sculpture.

By tracking the evolution of the movement as a technical value, we note that the continuous technical development has led to the emergence of new forms of expression, and it have relationship with the scientific and technological development in the sixties and was accompanied by a shift in the requirements of the new life. The modern currents return back its roots to the pre-fifties sometimes, and collect common elements between them, and met upon common objectives, these currents have been named by various names: such as visual art, kinetic art, cyber art, and perhaps the basic premise for it lies in the attempt of the artist to invest visual sensations data, and what generated from the optical delude, therefore as Popper, says in his book, the new trend is linked to kinetic art with the issue "dialectical relationship between objective vision and the vision of self, among other physiological and psychological phenomena" (Amhaz, 1996: 172). These controversial issues are still considered to enrich the field of art in general and the jewelry topic we discussed the current research, in particular, so as to produce works keep pace with the current era and benefiting from the experiences of recent trends and beyond to represent the actual and illusion movement, to commensurate with the properties of metals.

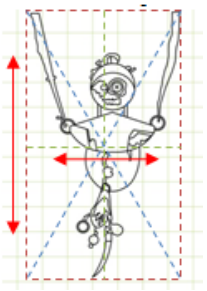
Structural System for the Design of Jewelry

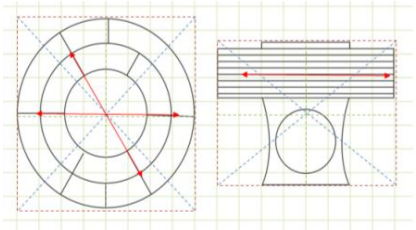
Despite the similarity of the design elements in the art of jewelry, but they differ from each other, this difference is caused by the building system of these elements in a certain frame, so that the results from this organization relationships check some of the values that serve as the goal of the system and its function, and it is determined the extent of its richness and distinctiveness. It is important to recognize some of the fundamentals that need to be taken into account for the organization of the design elements, namely:

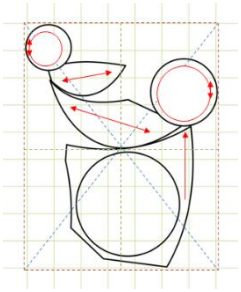
- Shape and ground: They are the basis of relationships for each installation and configuration in construction or design, sometimes referred to them to indicate that the figure is a positive element.
- Compatibility and contrast: The contrast and its grades have an important role to realize the differences between the design elements such as shapes, lines and color grades, which is the opposite to compatibility, compatibility means the case in which two contrast things or things linked in a graded

manner, and could explain the variation and compatibility in jewelry cases in the final finishing of the surface appearance of the enamel or coverage through oxidation, as well as different kinds of paint.

Description and Analysis of Selected Jewelry in the Light of the Movement

Part Number (1-1) / Source: Dormer, P. & Turner, R. (1994). *The New Jewelry*, p.126	
Type: Pendants	
Artist: William Harper	
Date of Manufacture: USA, 1980	
Raw materials: Gold, Silver, Enamel, Pearl **Size:** 9cm	
Techniques: Cut, pounding, grafting by enamel, studs with pearls, welding	
Movement type: normal **Artistic direction:** abstract	**Building design:**
Analysis of building systems design of the constituent elements of the worked jewelry Construction design depends on the shape of the rectangle of the general body for circular form the basis of the general shape, taking from the dimensions of the human body a building to the shape, where it shortened the details of the head, by the circular shape, mounted on metal rods represent the neck, and part of the trunk into two parts, the first is a third of the circle reflects the shape of the shoulders and the second take the oval shape dangling from them a set of beads to suggest the foot shape. The artist also rely on disparate colors to emphasize the idea and direction of the general body of the shape.	

Part Number (1-2) Source: Artist site Michael Berger	
Type: ring -kinetic rings	
Artist : Michael Berger	
Date of Manufacture: WestGermany, 2010	
Raw materials: steel, acrylic glass, image	
Techniques: cutting, refinement, welding **Size:** 3cm	
Movement type: actual **Artistic direction:** kinetic art	
Analysis of building systems design  The construction design depends on circular shape it is a group of overlapping circles, they represent the shape of a circle of colors, where the ring is composed of three layers of the circular shape topped with a layer of transparent acrylic, they are of normal or regular rhythmic system, which was arranged vertically, and in turn it constitute a multi-color relationships as a result of the movement which depends on the magnetic force, here, he used repetition to form optical illusion, we note that here the rhythm is color. However, the system of rhythmic lines gives radiation to top of the ring gave the piece dynamic dimension according to the circular engineering system.	**Building design:** 

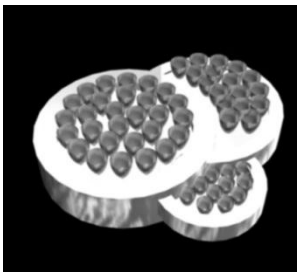
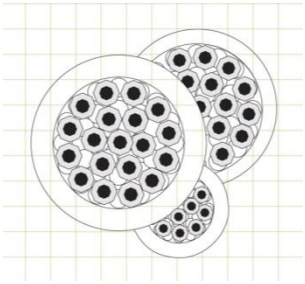
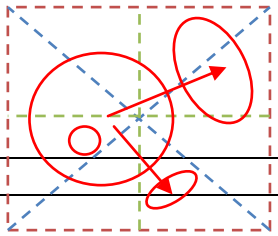
Part number (1-3) Source: Artist Site Michael Berger	
Type: Ring **-** Kinetic rings	
Artist: Michael Berger	
Date of manufacture: West Germany,1980	
Raw material : Pearls, Gold **Size :**4cm	
Techniques: casting, finishing, setting	
Movement type: actual **Artistic direction:** Kinetic	
Analysis of building systems design The construction design of the general body consists of the rectangular piece, which takes the simple geometry of the component and seeks relationships between all elements of a form of bonding, It is a form of bonding, it is overlay contradictory rhythm rising to the top. However, the outer limits are free with necessary curves to fit its function for easy use, where we note the non-symmetric construction and equilibrium of the shape using the principle of distance from the focal point and the size of the ball, it is a kind of visual equilibrium as a result of equivalent of the powers to the parties about the vertical axis of the design. The movement here is axial but opposite to other which creates an amphibole kinetic rhythm, it is rhythmic systems of the vehicle, it is caused by the driving forces resulting from the distribution of gravity and seismic movement of the body, depending on the severity of the magnetic attraction where the mineral ores characteristic by such property which are called magnetic minerals, because the ring when static become stable and once be touched and vibrated starts in motion derived from the human body energy to be transformed from potential energy to moving magnetic energy in repetitive system of locomotors rhythm.	البناء التصميمي: 

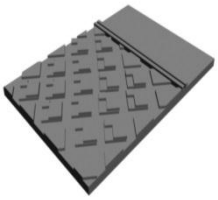
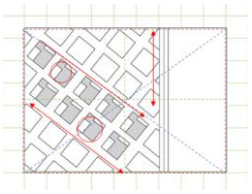
Innovative Design Solutions to Achieve the Movement

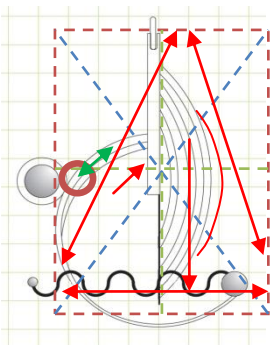
Practical Applications of the Researcher

Number of constants and variables have been determined to achieve the concepts of movement invested by the researcher in the experiment, so as to find out the available possibilities to prove the research hypotheses, where the delusional motion was used as constants for the experience and it is the base on which the combination between the two types of movement is established to reach the possibilities offered by computers in this area to devise design solutions based on kinetic rhythmic systems and the possibility of unimaginable before embarking on implementation, as the researcher has identified variables that form the structural design and they are as follows:

1. Variable of raw material and possibilities of computer programs.
2. Variable of texture and possibilities of computer programs.
3. Variable movement rate and possibilities of computer programs.

Design No. (2-1): Brooch, applied by the researcher	
Type: Brooch	
Size: 5cm	
Raw materials that can used in execution: metal bands, wires, gemstones	
Proposed techniques for the implementation of the design: cutting, molding, bending, moving the focal	
Movement type: Fake - a natural	
The program used in the design: PhotoShop, 3D Max	
Analysis of building systems design Building design depends on the square shape, which helps to confirm the stability of the general shape, while I relied on the circular shape of the design elements because of its latent dynamic energy to make a balance between stability and dynamic for the circular shape which was confirmed by repeating the sparse small circles overlapped entirely on circular discs with full overlapping consist of 3 discs with deferent sizes and deferent levels as well, which gives the rising rhythm of the levels of design that integrated with the influence of delusional motor of overlapping circles, in addition to the natural movement of the circles, which take the form of bells through its mobile connectivity as a result of the movement of the body to give a variety of rhythms sounds, where design adopted on the second and third entrance	**Building Design**  

Design No. (2-2): Square brooch, applied by the researcher	
Type: Brooch	
Size: 5cm	
Raw materials that can used in execution: metal bands, gemstones	
Proposed Techniques for the implementation of the design: cutting, drilling, welding, riveting	
Movement type: Fake - actual	
The program used in the design: 3D Max	
Analysis of building systems design Researcher relied on the square shape, it is a simple geometric shape gives a sense of stability, and above it is boxes stacked repeatedly in the left part, it is a normal iterative system based on the principle of the overlay for the square segment, whereas the boxes topped by boxes of unsymmetrical sectors to create optical illusions, in addition to the actual movement of the small boxes that rotate clockwise to form formal changes to the Brooch thorugh using motors work with the small battery.	**Building design** 

Design No. (2-3): Design Pendant by the researcher	
Jewelry Type: Pendant	
Size: 9 cm	
Raw materials that can be used in execution: Metal pipes and wires, stones	
Techniques proposed for the implementation of the design: Cutting, welding, casting, grafting with precious stones	
Movement type: Fake - actual	
The program used in the design : 3D Max	
Building design for the piece (default design) Construction design depends on the shape of the triangle to take stability situation resulting from the construction of one the direction to the above, and it is to opposite direction of gravity, gives an indication of the growth and extension, it is a factor which emphasizes the movement latent in the static overall shape, geometric shapes here confined in the circular shape and curved, giving flexibility and vitality, thus dynamic optical path of realization which creates a sort of balance between dynamic and static structural dimension in the design, which confirms the continuing cases of attraction to represent the system rhythmic movement of the placebo group to give us the delusional movement. In addition to the mechanical movement of the circle to give us variable forms of attraction between the column in the middle and small ball in the left pane to form a diverse kinetic rhythm.	

FINDINGS

1. The designer relied on the geometric shape, in order to create diverse kinetic rhythm. Jewelry designers invested variety of mineral and non-metallic ores to achieve the locomotors rhythm systems, where some of the industries associated with the modern and post-modern concepts of movement.
2. Multimedia is the common denominator in most arts of postmodern and one of production mechanisms and the ability to blend between different fields of art, this has yielded a different forms, and different concepts which are difficult to quantify in accordance with specific fixed or determinable standard as the predecessor of traditional arts, where it overtaken the traditional arts qualitatively and intellectually.
3. The multiplicity of axes of vision to jewelry from several angles by default, stimulates back feeding and facilitate to replace any part of the design without losing time or effort that could be lost when using manual techniques, which save economically and environmentally for each of the designers and the institutions that govern this area. It can also improve the designer design in terms of:
    - Diagnose weaknesses and strengths in jewelry.
    - Treatment of the vulnerable parts easily and with minimal effort.
    - The possibility of making many textures and color influences available in computer programs.

- The clarity of the evolution of the design on an ongoing basis.
- Rapid response from the program with the instructions for deletion or addition or switch.
- Store the multiple results of design and can be called at any time in the short period of time.
- The possibility of combining more than one type of movement by using graphics programs and presentation programs in the computer.

RECOMMENDATIONS

1. Adopt modern methods of teaching as to contain different section courses should contain developed mechanism to deal with multimedia such as video and computer and equipped it with the latest assistive devices and automated manufacturing devices to help in the development of creative thinking for design jewelry materials according to the latest theories and the foundations of contemporary intellectual.
2. Invite the owners of ornament factories and metal products in the Kingdom to open the field for the production of Saudi metal artifacts with international standards tracking contemporary thought.
3. Conducting experimental art workshops on an ongoing basis between the various disciplines in the university and between arts colleges to get advantage of interfering between the arts and integration of the arts in the current era globally.
4. Continuing research and studies for the various computer programs and the completion of current research of industrial design software for jewelers, and experimenting the possibilities of modern electronic devices for drilling and casting in the field of jewelry of all kinds, and what it could add to the metal arts.

Pursuant

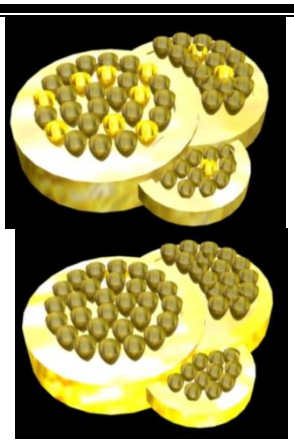
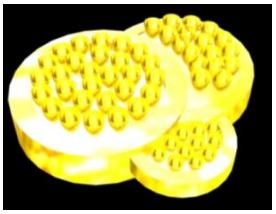
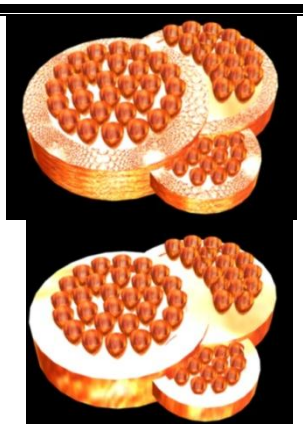
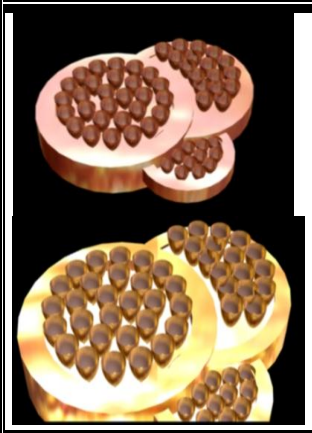
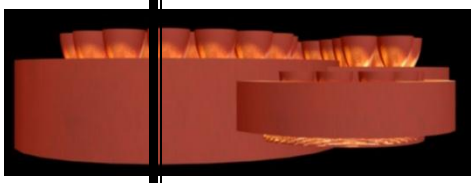
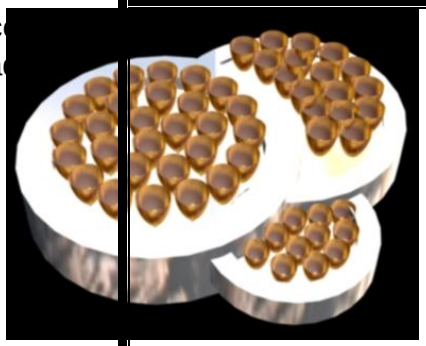
Alterabletread		Alterablecolor	
	Glace		Gold
	Glace Tread		Brass
	Glac Trea		Silver

Figure 1: Design No. (2-1): Brooch, applied by the researcher

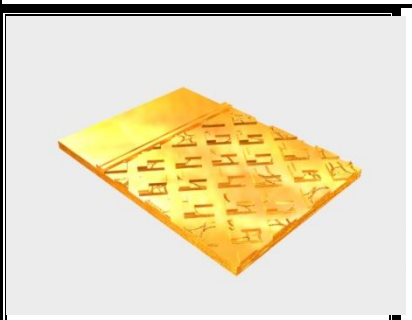
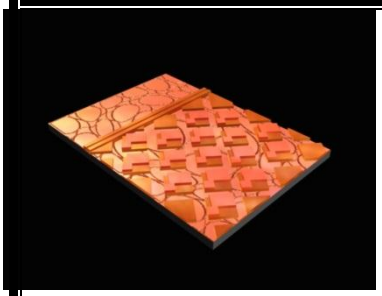
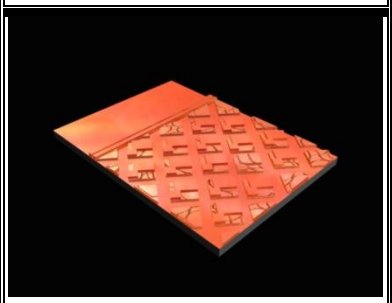
Alterabletread		Alterablecolor	
	Glace Tread		Gold
	Glace Tread		Brass
	Glace		Silver

Figure 2: Design No. (2-3) square brooch, applied by the researcher

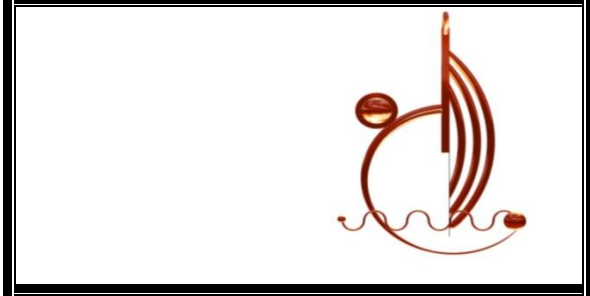
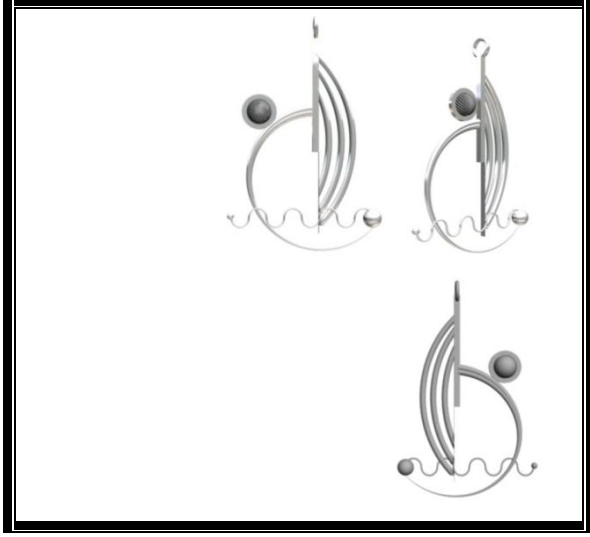
Alterabletread		Alterablecolor	
	Glace		Gold
	Glace Tread		Brass
	Glace Tread		Silver

Figure 3: Design No. (2-3): Design Pendant by the researcher

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