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Review of Kinetic Art as a Source of Inspiration in Fashion Design

Samiha M. Abo El-Ola[1], Eman A. Abd El-Kader[2], Manal M. El-Adawy[3] and Riham Ramadan Abd Elfattah[4]

[1] Prof. of Chemistry and Technology of Textile,Textile industries Research Division, National Research Centre.

[2] Prof. of Draping, Clothing &Textile Department, Faculty of Home Economics, Helwan University.

[3] Prof. of design & Textile printing, Home Economics Department, Faculty of Specific Education, Fayoum University

[4] Assistant Lecturer at Home Economics Department, Faculty of Specific Education, Fayoum University.

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ABSTRACT

Kinetic art artwork is an expression of the preoccupation with motion that characterizes a large portion of modern culture after Impressionism. When showcasing pieces of art that evoked strong emotions or that movement impression - from mechanical, moving sculptures to Op art paintings that appeared to spin or vibrate before the eyes, so Kinetic artists provided us with some of the best. As a result, the importance of three-dimensional shape, Kinetic arts in general, as a source for enriching the construction of fashion designs in structural, functional, and decorative design on mannequin as a three-dimensional design and an ideal way to highlight the aesthetics to obtain innovative designs. The research aims to study Kinetic arts to employ their capabilities in activating the imagination and develop creativity as inspiring source for structural, functional, and decorative fashion design. The research reached to Kinetic art is a resource that adds creativity to design. And there are two types of kinetic art, and both add new dimensions to design in general, and to fashion design specially.

1. Introduction

An expression of the preoccupation with motion that characterizes a large portion of modern culture is kinetic art artwork after Impressionism When showcasing pieces of art that evoked strong emotions or that movement impression - from mechanical, moving sculptures to Op art paintings that appeared to spin or vibrate before the eyes, so kinetic artists provided us with some of the best

The movement of the artwork is related to the viewer's movement, and the movement may self-grow within the artwork itself and respond to the environment automatically.(1)

The design on mannequin differs from the rest of the design types in the artistic style, as it incorporates three-dimensional designs that give it significance in terms of a sense of mass, movement, space, texture, color, and decorative design (2),

Innovation in fashion generally and fashion design particularly, the creation of unique designs is influenced by a variety of factors, including the designer's inspiration sources, whether historical or artistic. so many international fashion designers have benefitted from this art by incorporating models inspired from it into their works, which has given their designs a sense of renewal and innovation, as well as given them a unique character.

As a result, the importance of three-dimensional shape, kinetic arts in general, as a source for enriching the construction of fashion designs in structural, functional, and decorative design on mannequin as a three-dimensional design and an ideal way to highlight the aesthetics to obtain innovative designs. Where movement arises in design, whether aesthetically through decorative design and visual arts, or tactilely by adapting and changing designs through moving them to create new designs.

The research question: The research problem can be formulated in the following questions:

1-What is the benefit from three- dimensional shape and Kinetic arts as a source of inspiration for fashion designs characterized by modernity and innovation?

2-What is the use of three- dimensional shape and Kinetic arts to enrich the structural, functional, and decorative of fashion design?

The aim of this study

The research aims to study Kinetic arts to employ their capabilities in activating the imagination and develop creativity as inspiring source for structural, functional, and decorative fashion design.

Research Methodology

The study follows the historical method and descriptive analytical method in studying analyzing previous studies and designs.

2. Search procedures

2.1. Theoretical framework

The design on mannequin are aesthetic style and a realistic practical means of creating fashion design as well as realistically judging the validity of the implementation idea. It includes three-dimensional shapes that give it importance in terms of a sense of mass, movement, space, texture, and color. (3)

Draping plays a major role in creating unique three-dimensional designs. It is one of the unique garment-making techniques and can be considered the only type of fabric-based design. (4)

Tele:

E-mail address: mma02@fayoum.edu.eg

Thus, in the following, Kinetic Art will be studied as a source of inspiration for both the design and draping on mannequin.

2.1.1 Motion

Motion is defined as observable or implied changes in the position of an object in a design. Movement allows the possibility of the growth of the artwork. This growth can be observed through the emotions and reaction of the viewer to the artwork, and the movement of the artwork is linked to the movement of the viewer, The movement may self-grow within the artwork itself, responding automatically to the environment. (5)

Movement is useful in guiding the eye through the image, and the human eye tends to follow the moving object or the observed path in a fixed position. For this reason, the moving elements should adjust their movement within the artwork space. The movement can be managed through lines, shapes, and the outer limits of shapes and colors within the design.

Perspective helps in feeling movement, as the linear perspective, in which the shapes end to a point in the middle of the work, the eye automatically moves towards that point, and the movement should lead us to the point of interest in the design.

Electric light plays an important role in the sense of movement in art, as Dan Flavin wrote, that light is another tool responsible for techniques affecting kinetic art. (5)

The growth in the artistic work resulting from the movement is not intended as a quantitative growth, but rather the increase in energy in all directions. (5)

Kinetic arts can be divided into two categories. The first category means actual movement, and the other means static form, but it has an imaginary movement that can be perceived on the retina. (6)

2.1.2 Kinetic art

The word kinetic is derived from the Greek word kinesis, which means the representation of movement or change in Aristotelian philosophy, and kinetic art refers to works that are characterized by realism or apparent movement, and includes many artistic forms, types, media types, and styles. (6)

Machine art is another extension that falls under the broad umbrella of kinetic art, and it represents the ultimate link between art and machine, between creativity and safe technology.

Therefore, the researcher studies the impact of this pioneering visual experience based on dynamism, called kinetic art, on the fashion design and implementation.

Although the idea of kinetic art was not established as a major art movement until the 1950s, its origins go back to the early 1920s.

2.1.3 Futurism

The concept of movement in art goes back to the doctrine of futurism, so the artists tried to express what They felt about this new beauty of speed and motion derived from modern mechanics. **(7)**

The Futurists found a way to suggest movement through space, but they were unsuccessful in finding the pictorial structure that moves by itself, we find some of them like movement by rhythm in the figurative painting, and others the form in their works is rhythm, although their drawings may seem at first glance more stable. **(9)**

One of the most important creative artists who belongs to the futurism is the artist Umberto Boccioni (1882-1916 BC), as he expressed speed in his figurative and sculptural forms **(8)** as shown in Figure (1).

Figure 1. One of the Paintings by the Italian artist Umberto Boccioni (8)

Boccioni considers that the artist should focus in his sculptures on the expression of movement, and the adaptation of all materials in sculptures without restrictions. (6) While the word "kinetic" was used for the first time in the visual image in the publication on realism in 1920 AD.

2.1.3.1 Gabo Nauom

Gabo Nauom can be considered as the pioneer of the modern era in kinetic art. He was knowledgeable in both the natural sciences, engineering, and the application of the principles of dynamics, and completed many works of kinetic sculpture (6), and kinetic sculpture (Standing Wave), created by Naoum Gabo in 1919-20, who is considered the pioneer of modern kinetic art. (6) The artistic innovation of Gabo was not just an aesthetic innovation but was the result of his technological research. It was to impart movement to his works a kind of rhythm.

2.1.3.2 Alexander Calder

Kinetic art has given birth to many innovators, including Alexander Calder (1898-1976), who demonstrated in his works the movement of a solid and demonstrated how mass can decompose. This work represents one of the first attempts to show the subtle effects of movement and light to create a complete image as a new visual experience.

He presented abstract hangings, on beams of thick wire from which hanging strings carrying other beams shorter in size and hanging from the latter strings with various areas of aluminum, iron, or tin, or cardboard painted in dark colors sometimes.

When this hanging sculpture is suspended from the ceiling, it begins its movement under the influence of air currents, so the pendants rotate, and due to the light shining on them, it has shadows on the walls and floor of the room, but these shadows are dark, barren, moving spaces and their shapes and positions change with the change of movement.

When they cover each other or unfold, light spaces are left, amid moving shadows. The idea here is that abstraction is not only in static forms, but in the effects of moving and permanently moving forms, and the side forms that they cause by the action of shadows and their movement. This type of abstraction can be seen in the shadows of the tree's leaves, which is emitted by some of the lights directed on the trees, casting shadows on the trees leaves on the ground.

The leaves do not appear in their natural meaning when they are shadows, but rather appear as spaces that are rhythmically repeated, evoking light spaces, as if they are abstracted from the natural origin and through which the rhythmic system appears in repetition and movement clearly. As shown in Figure (2).

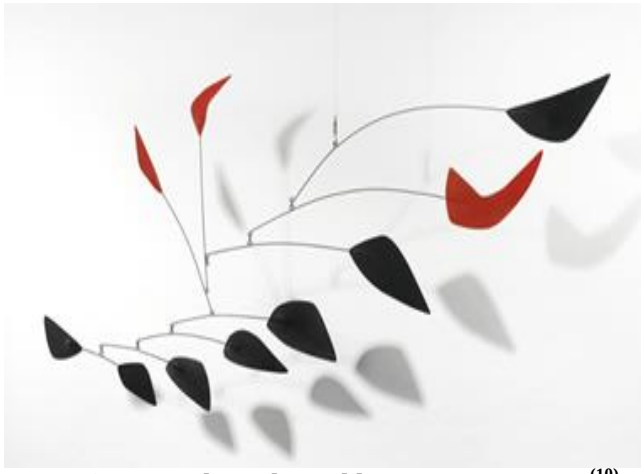

Figure 2. Alexander Calder "No Name" 1963[(10)]

Kinetic art is inspired by the DADA art movement, which supported satirical, conceptual and constructivist art, which employed architectural elements, entrenching kinetic art as one of the modern art movements of the early twentieth century and culminating in the fifties and sixties, the following is a historical summary of this doctrine**:**

2.1.4 The Historical Development of Kinetic Art before the Twentieth Century

In 1897, one of the mural art drawings with the theme of jumping cattle was found. Painted by the ancients 20-30 thousand years ago in the Grotto Cave in Cantabrian, France (6) where flow and simplification appear in the depiction of animal dynamics, which can serve as evidence that the ancients cared about dynamic things. (6)

In the ancient Egyptian era, a doll from the ceremonies of Osiris was found in Egypt. It has a height of about 50 centimeters, which can be pulled with a chain. As shown in Figure (3**)**.

Figure 3. A Doll from Ancient Egyptian Art (6)

Then it was found in one of the tombs in ancient Egypt in Memphis, and others., Many dolls have movable shoulders and have joints in the feet, and these dolls are characterized by the possibility of being pulled by a chain to cause movement, and in addition to the joints of the hands and legs, we find that the armor of these dolls can make simple movements. up and down. [(6)]

Thus, the extent of interest of the ancients in the various scientific principles of designing machines and tools or artistic expression, whether these inventions were functional or not, is correct, as they are all valuable works of art**.**

2.1.5 The Historical Development of Kinetic Art in Modern Art

At the beginning of the twentieth century artists were not comfortable with traditionalism in photography and sculpture, many artists were interested in the movement featured in modern equipment**.**

At the beginning of the twentieth century, artists sought to introduce movement in their artwork in part to explore the possibilities of movement, and to review the element of time in artwork, thus reflecting the importance of machine and technology in the modern world and the technological achievements of solar energy, sound waves and optical fibers are just some of the elements that have been included under umbrella of this artistic expression [(9)]

Kinetic art is a dynamic expressive model that can be perceived. As progress and continuous improvement in science and technology, thus, the kinetic art unites with the renewable technology annually with the presentation of different aspects deeply influenced by technology. [(6)]

Early 20th Century: In 1913, artist Marcel Duchamp began exploring the idea that art could be interactive, so he created, in his studio in Paris, what might be the first piece of kinetic art, a bicycle wheel as shown in figure (4), by gluing A bicycle wheel on a chair in such a way that the wheel can rotate freely.

Figure 4. Bicycle Wheel - artist Marcel Duchamp 1913. [(9)]

1920s: In 1920, brothers Antoine Pevsner and Naoum Gabo formulated the term "kinetic art" in the Realist Manifesto, a poster-sized statement advocating constructivist ideals and the idea that modern art should be grounded in place and time. That same year, Gabo created Kinetic Construction (Standing Wave), an influential kinetic artwork that uses electricity to make a strip of metal that swings. [(6)]

1930s: In 1930, Hungarian artist László Moholy-Nagy completed his work on the piece called the Light-Space-Modulator, a mechanically powered kinetic sculpture with several interlocking components. [(6)]

1940s: In 1941, American sculptor Alexander Calder became famous with his Hanger, a petal-like movable beam with a wire frame and movable he created using a wire frame. Fig. (2)

1950s: The kinetic art movement reached its zenith at the 1955 exhibition, Le Mouvement, at the Galerie Denise René in Paris. The exhibition featured works by artists who

experimented with the movement including Jean Tingley, Alexandre Calder, Jacob Agam, Marcel Duchamp, Jesús Rafael Soto, and Victor Vasarely. [12]

George Rickey also arrived on the scene around this time and influenced other movement artists with his organic and playful sculptures.

1960s: Swiss painter and sculptor Jean Tinguely unveiled his most famous kinetic work, Salute to New York, in New York in 1960. It is a large-scale system, it featured many moving parts, and the work included some parts that could self-destruct and were deliberately set on fire. This piece also popularized the use of found objects, and this style is what was later known as "junk art". As shown in Figure (5) [12]

Figure 5. Artwork by Jean Tinguely 1960 – Metamechanics. [13]

1970–present: By the early 1970s, kinetic art had fallen in popularity as many artists turned to Op. art and experimental digital forms. However, contemporary art continued
Drawing inspiration from kinetic artists [12]

The sense of movement results from the meeting of mechanical movement and optical illusions. After a decade, the Op. Art movement became more popular and widespread, and many artists lost interest in the movement. Until 1955 AD, the movement became a global art that many artists yearned for and followed [14].

Geometric abstraction as a traditional method was in decline in the post-World War I period, but the kinetic art movement revitalized this trend by using mechanical or natural movement to form a new relationship between art and technology, so kinetics spread through several forms of art, including painting, photography, and sculpture. They are just some of the mediums that are used to convey the art of the movement. By the 1960s which saw great success for the movement and its practitioners, artists gained international recognition and began winning many prestigious awards for painting, sculpture and more.

Thus, we find that kinetic art before the twentieth century mainly aimed at creating a more convenient and efficient way of life.But in the twentieth century, when the products of modern industrial technology (i.e., machines, tools, and modern materials) under development, kinetic artistic design directed towards the field of art. This new transformation provided an opportunity and energy for art, which later evolved into kinetic art. [6]

The Bauhaus School has included kinetic art in its curricula, as an artistic direction that combines art and related basic sciences in the pre-school curriculum. In addition to that kinetic art must combine scientific knowledge and technology; kinetic art began to become the focus of research and direction for design elements, laying the foundations to teach the futuristic design of kinetic art. [6]

2.1.6 Lines in Clothes and Movement

The movement in clothes can be electronic, where the designer uses a technology specialist and there are many examples of designs for clothes using new materials for designers whose designs are characterized by innovation and modernity, for example, fashion designer Ying Gao who designed a group of robotic dresses in 2017, where various sensors and software were used to design the piece of clothing called Jellyfish dress, as shown in Figure (6), and other designers also used other techniques, including what relied on electronics, smart chips, and wireless technologies. [11]

Figure 6. Jellyfish dress design by fashion designer Ying Gao. [11]

2.1.7 Visual Art and Fashion Design

2.1.7.1 Movement in Visual Art(Op. Art)

Visual art is one of the trends that branched off from geometric abstraction, and it is called the movement of abstraction and deception of the eye, this tendency is known as “Optical Art”, its abbreviation is Op. Art This doctrine in France is led by the artist Vasarelly.

The proponents of this doctrine see that artistic, aesthetic, and innovative values are evident in their abstract works more than in any other art, they are concerned with line, space, and form, they are not concerned with diagnosis or subject matter.

This art appeared in the second half of the twentieth century and is based on some sensory tricks in the process of visual perception and the resulting vibrations of vision, which in turn cause a kind of movement. [7] Little by little, the artists reduced the abstract geometric shapes, in favor of stimulating Movement using contrasting colors and shapes.

In 1965, a huge exhibition of OP Art was held, entitled “Responsive Eye.” The audience went with this movement

because it quickly became associated with the cultures of the sixties.[15]

It is shown in Figure (7) A long dress from the Asos collection made of soft, lightweight woven fabric, and has a boat neckline, we find self-tying in shoulder details - pleated and high waistline, drop skirt, The dress was printed in black on a white ground with regular and repeating shapes.

Figure 7. tall dress from Asos collection that represents visual art source. [15]

We find that artists have used contrasting colors and geometric shapes that are repeated in specific compositions, to produce designs and patterns that seem to interact visually and move, so Many artists and textile designers, and many fashion designers began incorporating the visual language of OP Art In prints and woven fabrics. This can be seen in the use of simple and bold designs in complex combinations of colors and decorative units that make the clothes appear to be self-moving. Often only black and white were used.

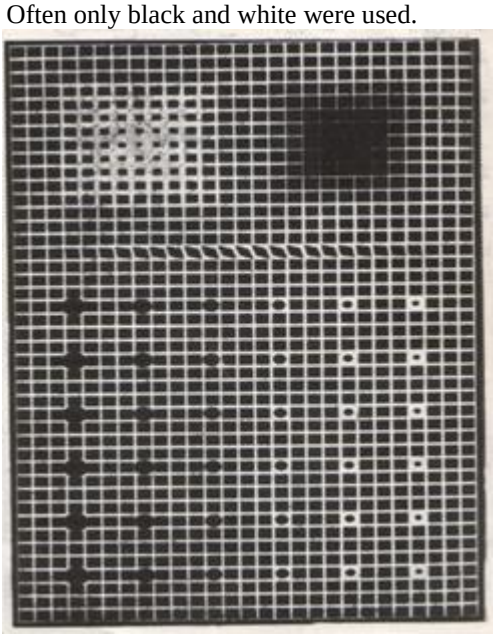

Figure 8. Victor Vasarelli - Lines - 1961 AD O P. art [15]

Figure (8) Shows the abstraction of Fazzarelli with a geometric character Which represents the programmable electromechanical toolkit assists designers by allowing them to create such shape-shifting structures without going through all the steps normally required.

Many examples of design with the Pneuduino were shape shift cans, interactive lever, and tactile gloves This type of kit could mark a step forward in shape shift computing; It can also help designers to design more easily with fabrics that would change their shape for use in origami design. [11]

Interactive fashion design is a new and demanding field and inspires fashion designers with various new ideas. Recently, electronic devices have increased, become smaller in size, decreased in price, and become smaller, more portable, and mobile, that giving more opportunities for designers to explore new wearable designs with new functions. [11]

3. Results and Conclusion

The research reached the following results

1-Kinetic art is a resource that adds creativity to design.

2-There are two types of kinetic art, and both add new dimensions to design in general, and to fashion design in particular

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