

USING ORIGAMI ART IN FASHION DESIGN TO PRODUCE VISUAL KINETIC TO BODY

SAMIHA M. ABO EL-OLA¹, EMAN A. ABD EL-KADER², MANAL M. EL-ADAWY³
& RIHAM RAMADAN ABD ELFATTAH⁴

¹Professor. of Chemistry and Technology of Textile, Textile industries Research Division, National Research Centre.

²Professor. of Draping, Clothing & Textile Department, Faculty of Home Economics, Helwan University, Egypt

³Professor. of design & Textile printing, Home Economics Department, Faculty of Specific Education,
Fayoum University, Egypt

⁴Assistant lecturer at Home Economics Department, Faculty of Specific Education, Fayoum University, Egypt

ABSTRACT

The arts of three-dimensional shape, movement and origami are important sources for enriching the aesthetic structure of fashion designs in terms of structural, functional and decorative in the design on the mannequin.

The art of origami is a historical and contemporary art at the same time, as it is a fine art that depends on the formation of flat paper and transforming it into a three-dimensional shape. It is characterized by having many types and different shapes that help the designer to enrich his designs.

The research aims to study the arts of three-dimensional shape and Kinetic arts to employ their capabilities in activating the imagination and develop creativity to inspire a structural, functional, and decorative design for fashion by presenting new formulations based on folding shaping in design on mannequin and benefiting from modern trends in the functional processing of textiles chemically / mechanically in obtaining new materials with various effects.

Create five designs for morning clothes compatibility of viscose which finished against wrinkle in implementation of origami units. The effectiveness of origami art in achieving visual movement and the third-dimension in designs executed on mannequin.

KEYWORDS: Fashion Design by Draping, Origam Art, Kinetic Art, Finishing Process, Functional Finishing, Mechanical Finishing & Anticreasing Finishing.

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1. INTRODUCTION

The fashion design on mannequin is a draping method that belongs to the fine arts. It deals with the material delicately with all its artistic capabilities. The draping produced the movement.

The movement allows the possibility of developing the artwork further. This development can be observed through the viewer's emotions and reactions to the artwork. 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 functional finishing of fabrics, whether mechanically, chemically, or both, is one of the modern trends in fabrics and clothing design that is evolving swiftly in tandem with the science development.

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⁾, Where it is possible to implement shapes or parts inspired by the draping on the mannequin and use them as ornamental designs, as well as fashion structural design using the finishing fabrics and different textile structures, so draping designs can be obtained.

Innovation in fashion generally and fashion design particularly, the creation of unique designs are influenced by a variety of factors, including the designer's inspiration sources, whether historical or artistic.

Origami art is a historical and contemporary art at the same time, as it is a fine art that depends on the draping of flat paper and transforming it into a three-dimensional shape. It is characterized by having many types and different forms that help the designer to enrich his artwork, 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, and origami in particular 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 and techniques of origami art 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.

Design on Mannequin

It is how to deal with the fabric to achieve the desired appearance or a specific design in the imagination of the person who is shaping the mannequin or the human body directly with the cheap fabrics or the final dress cloth to achieve complete harmony between the design, the fabric, the shape of the body and the designer's individual characteristics. Thus Design through draping expresses new innovative ideas at different stages during draping process.⁽²⁾

It allows the designer to reflect his perceptions and crystallize his ideas and individual artistic touches to create fashion designs and to derive new dimensions from the aesthetic possibilities of the fabrics, where the fabric is the source of inspiration for the designer while moving it on the mannequin.⁽³⁾

Origami Art

Origami is a Japanese word consisting of two syllables: "ori", which means folding, and "kami", which means paper. When the two words are combined, it becomes origami, which means paper folding.

It is characterized as a creative art that depends on paper folding to create abstract shapes as well as models or represent reality. The goal of this art was not particularly utilitarian, but rather entertaining and artistic.⁽⁴⁾

Functional Finishing

Also called chemical finishing or wet finishing, it is often used to impart new functions to textiles. But despite that, obtaining the functional properties of textiles does not depend on chemical processing only, but rather it is a combination of chemical and mechanical treatments and the properties of the textile material.⁽⁵⁾ Wet processing, i.e. the fabric is treated in a liquid medium. This type of treatment changes the performance of the fabric and gives it new properties such as (fire

resistance, soil resistance, wrinkle resistance, water resistance and others).⁽⁶⁾

Mechanical Finishing

It is Processing that depends on physical means to change the properties of appearance, surface and dimensions of the fabric, as in calendring, embossing, sueding, raising, sanfor, and heat setting.⁽⁵⁾

Wrinkle-Resistant

During wear and washings of the apparel, hydrogen bonds in the amorphous region are broken and re-formed at new locations creating permanent wrinkles. The primary method of creating wrinkle-resistant for viscose fabrics is to use appropriate agents to crosslink the cellulose chains in the fiber.⁽⁷⁾

Easy-care finishes for viscose fabrics have become very popular as they add smooth, aesthetic and flawless look for high-performance apparel.⁽⁵⁾ They are applied as functional finishes to suit the aspirational lifestyle to follow 'wash, dry and go' concept, saving time and energy spent on ironing clothes. ⁽⁷⁾

Kinetic art

The word "Kinetic" comes from the Greek word "kinesis," which means movement or change.⁽⁸⁾ In Aristotelian philosophy It denotes to works that are characterized by realism or apparent movement, includes many artistic forms, media types, and styles.⁽⁹⁾

The Research Question

The research problem can be formulated in the following questions:

- What is the benefit from three- dimensional shape and Kinetic arts as a source of inspiration for fashion designs characterized by modernity and innovation in the style of design on the mannequin?
- - What is the contribution of origami art to enriching the structural, functional, and decorative aspects of fashion design in the design on mannequin?
- What is the contribution of functional finishing, chemically, mechanically, or both, to enriching the design on the mannequin and creating various forms in the arts of three- dimensional shape and movement?
- What is the use of three- dimensional shape and Kinetic arts to enrich the structural, functional and decorative of fashion design in the design on the mannequin?

The Aim of this Study

The research aims to study the arts of three- dimensional shape and Kinetic arts to employ their capabilities in activating the imagination and develop creativity to inspire a structural, functional, and decorative design for fashion by presenting new formulations based on folding shaping in the style of design on mannequin and benefiting from modern trends in the functional processing of textiles chemically / mechanically in obtaining new materials with various effects.

Research Methodology

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

And the experimental approach, which includes the processing of fabrics and the proposed fashion designs in the style of design on mannequin, which is carried out by the researcher by making use of three- dimensional shape and Kinetic arts.

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.⁽¹⁰⁾

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.⁽¹¹⁾

Origami art is a complex art in terms of experience and techniques in paper folding. This type of art is not only applicable to fine arts but is also influential in fashion. With the development of textile engineering, there are different choices of materials and fabric for origami art.⁽¹²⁾

The origami art is an ancient art of folk crafts. It aims to transform flat paper through folding techniques into a three-dimensional object that has a specific shape. It usually looks like an object. Paper is usually used in square shapes and multicolored.⁽¹³⁾ It achieves a strong sense of three-dimensional space and special texture effects. Origami as a source of inspiration in modern fashion design creates new designs on the structural and decorative level of fashion, achieving a new aesthetic taste for clothes.⁽¹¹⁾

By using origami art as an inspiration source in fashion design. It was found that the schematic relationships of this art and its various structural characteristics help fashion designers to discover new forms and expand the framework to reach innovative designs.⁽¹⁴⁾

As the pioneers of this art in fashion design, the Japanese designer "Issey Miyake" as shown in fig. (1),(2),(3) and the British designer "Charles James" are the pioneers of introducing this art into fashion. Through the use of fabrics with certain properties to be permanently folded through the use of certain technology on polyester fabrics, which produced unique designs.⁽¹⁵⁾



Figure 1: Origami Fashion Design- the Japanese Designer "Issey Miyake"⁽¹⁶⁾.



Figure (2)
Figure (2,3) Origami Fashion Design- the Japanese Designer "Issey Miyake"⁽¹⁶⁾

Miyake's experiments with all kinds of pleated fabrics have become a pioneer for new ideas, whether in terms of materials or shapes. Its innovative wearable designs inspired by folding techniques are considered high-tech and fun at the same time. Where he employed origami not only as a structural technique for holding pieces of cloth together, but also as an aesthetic element in terms of placement and finishing.⁽¹⁷⁾

Kinetic Art

Movement in art is the most noticeable thing in the visual field, and it is defined as the convergence or divergence of shapes in a given direction to appear as if they are rushing towards the direction due to the illusion of movement.⁽¹⁸⁾

Kinetic art refers to works that are characterized by realism or apparent movement, it includes many artistic forms, types, styles of media, and styles.⁽¹⁹⁾

The optical movement does not depend on the sense of sight only but also depends on the movement is useful in guiding the eye through the design, 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, the outer lines of shapes and colors within the design.

The optical movement is based on the optical illusion resulting from the perception of shapes in whole or in part by deletion or addition as well as resulting from convergence and divergence through the existing relationships between lines, shapes, units, geometric formations, innovative formations, color variations and differences in sizes, whether increase or decrease, which all generate an illusion of movement, vibration, ripple and glowing.⁽²⁰⁾

One of the characteristics of shapes in the visual art products is that they tend to be a geometric nature as they tend to be abstract shapes. We find that the origami art units are suitable and effective in achieving movement, changing shape, and that its application on fabric produces modern designs with aesthetic value.⁽²¹⁾

Kinetic art has given birth to many innovators, including Alexander Calder (1898-1976), who presented in his works the movement of a solid and explained how mass can decompose. This work represents one of the first attempts to show subtle effects of movement and light in order to create a complete picture as a new visual experience as shown in fig. (4).⁽²²⁾



Figure 4: Alexander Calder 1963⁽²³⁾.

Understanding the mechanism by which folds can be generated in fabrics is the first step to success in transferring paper folding techniques to fabric shapes. We can replicate paper folds using steaming, ironing, and chemical treatments like hot shaping or mechanical fixation.⁽²⁴⁾

The final processing is used to enhance the product's appearance through (dyeing, printing, bleaching, glossiness, etc.) Improving the material's textural features (softness, hardness, drooping, etc.) and providing it properties that make it easier to use, (anti-wrinkle, flame-retardant finishing, water impermeability, shrinkage resistance, and others)⁽⁶⁾

Anti-crease finishing is known by other names, "Easy Care", "Wash & Wear", "Durable Press", "No-Iron" and others. It is one of the most important aesthetic properties of fabrics and clothing. It is an important factor that affects the efficiency of fabrics in use and helps clothes to retain their appearance.⁽²⁵⁾

Easy care supplies have become very popular because they add a smooth, beautiful and flawless look to fabrics, their main objective is to be able to wash clothes with minimal wrinkling so that they require the least amount of ironing to restore their original appearance. This type of treatment is generally applied to shirts and blouses to avoid wrinkles during wearing or after washing. Where it is applied as a functional finishing to suit the lifestyle and follow the concept of wash and wear, which saves time and energy spent on ironing clothes.⁽⁷⁾

Thermal stabilization technique as a mechanical finishing for fabric allows us to rework the fabric surface to create new appearances for the fabric by using it to make folds, wrinkles, ripples, and protrusions, which provides us a lot of design suggestion options. It can be used to create the extreme shape.⁽²⁶⁾

Both types of finishing enrich the designs inspired by the art of origami by forming on mannequin. Therefore, the researcher studies the impact of this pioneering visual experience which based on dynamism called kinetic art, on the design and implementation of fashion.

3. EXPERIMENTAL:

3.1. Material

3.1.1. Fabrics

Different treated fabrics were used in this study [white viscose fabric 100% 45/65 inch of weight (115.6125 g/m²), fabric

preparation conditions, Enzyme (2 g/l) Archroma management LLC, Washing agent (2 g/l) Al Wataneya for Trade & Chemicals CO, Sequestering agent (1g/l) at 70°C for 30 min., then hot rinse at 80°C for 10 min., then rinse by Sodium bicarbonate (1g/l) at 70°C for 10 min., then cold rinse for 10 min.

3.1.2 Chemicals

- Dimethyl-Dihydroxy-Ethylene urea modified (modified DMDHEU) (80g/l) Produced by (ACP advanced chemical processing) company.
- Magnesium Chloride ($MgCl_2 \cdot 6H_2O$) it was used as a catalyst agent (20 g/l) produced by (SD. Fine-Chem. limited) company.
- Silicon (30g/l).
- Softener (30 g/l).
- Acetic Acid (0.5 g/l).
- Optical brightener produced by (IST OPTIC CO-B) company.

3.2. Methods

3.2.1. Finishing

Bleach white fabric with 1% bleach by weight of the fabric, the white and dyed fabric was immersed in the finishing solution consisting of all chemicals above. Then Fabric squeezing by 85%.

Roast the fabric at 175°C for 1 minute then Sanford fabric to soften the texture and gloss it.

The wrinkle angle of the finishing fabric was tested at the laboratories of the National Research Center: Dokki, Cairo.


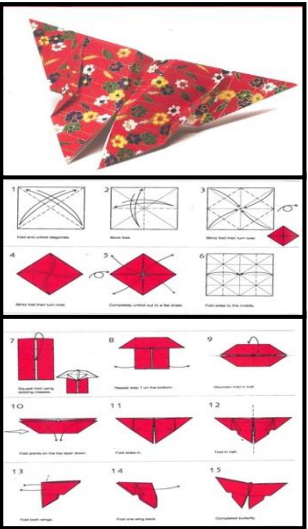

4. DESIGNS INSPIRED FROM ORIGAMI ART ON MANNEQUIN

Conditions to consider when applying the art of origami in draping on mannequin include:

- Choosing enough attractive units for the designer to generate ideas by incorporating them into his designs.
- Study all the complete folding steps and drawing before starting.
- Experimenting on paper first to reach a good shape and then applying it to a fabric sample to see how feasible it is on the fabric and solving any difficulties in implementation before applying it to the final cloth.
- Considering the accuracy in folding, as it serves as a guide for the next steps, taking into account the difference between paper folding and fabric folding. In paper folding we use finger pressure, while folding the fabric we use the iron.
- Paper is available in different colors on both sides, and this can be achieved in fabric by sewing two pieces of different colors.
- Usually, the art of origami begins with a square sheet of paper, but for the art of origami with fabric, this is not required.

- Light fabrics clearly show folds, while thicker fabrics such as wool do not fit with all units, so the material must be tested to see its suitability for implementing the origami unit.
- The methods of finishing origami units differ according to the different materials used in the implementation, including the use of direct heat, cutting with hot scissors, cutting using a laser, or cutting with ordinary scissors.
- The laser cutting device is suitable for all types of fabrics to achieve the desired finish.
- Some origami units implemented on the fabric need to be strengthened to give the desired effect.
- Origami units can be implemented in some minutes and sometimes work extends for hours, days and weeks depending on the work produced.
- Considering the accuracy with which the procedures are carried out while producing the folds, because any mistakes during implementation, the fabric may prevent the final shape from being achieved.

4.1. Fashion Design No.[1]:

Design No.	Implemented Design	Origami Unit	Origami Unit in Fabric
(1)			

Model No.: 1

Fabrics types: 100% white viscose fabric (45/65 inch) of weight (115.6125 g\m) in all design.

Anti-creasing finishing: DMDHEU (80 g/l), MgCl₂ (20 g/l), Silicon (30 g/l), Softener (30 g/l), Pick up 85.8%, curing 175°C for 1 min.


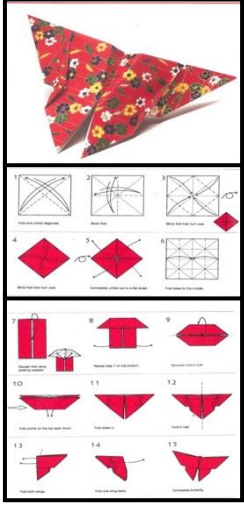

Type of clothes: Morning blouse Size 44.

Model description: It is a morning blouse made of viscose fabric with anti-wrinkle finishing in white color. This design inspired from Butterfly origami units, in which the fabric was cut into square pieces using laser according to the desired sizes. The unit steps were carried out on the fabric using the iron and stitches. The model is formed on the

mannequin, with the units distributed in formal relationships on the neck and chest area, and making diagonal slanted pleats in the tail. Where the implementation and completion on the mannequin.

Artistic Analysis: Origami art contributed to the model decorative design. The structural basis of the design implemented on mannequin is the repetition, overlap position and intersection of the origami units through the flow of units lines in different directions. The gradation in the units sizes and the areas gradation in their distribution led to create kinetic communication, which achieves the rhythm in the design. Balance was achieved by distributing the units in the neck and chest area, and varying lengths pleats on the tail. The ratio and proportionality between the decorative areas' size of the origami units and the background was also achieved. The origami motif helps emphasize the structural design and the neckline. The aesthetic relations and the overlapping of units helped to confirm and highlight the shapes and determine their relationship to the background. The design elements in the model played a major role in parts of the design unity, which lead to unity of composition and balance of forms. The overlay of origami units helped create texture densities, which gave special effects to the viscose fabric and achieved a sense of three-dimensional. The refractions associated with the lines of the three-dimensional origami units lead the eye from one area to another in the design, which achieves a sense of movement and dynamism in design and achieves visual movement. The contrast between the shape of the figure and the background evokes a sense of movement.

4.2. Fashion Design No.[2]:

Design No.	Implemented Design	Origami Unit	Origami Unit in Fabric
(2)			

Model No.: 2

Fabrics types: 100% white viscose fabric (45/65 inch) of weight (115.6125 g\m) in all design.

Anti-creasing finishing: DMDHEU (80 g/l), MgCl₂ (20 g/l), Silicon (30 g/l), Softener (30 g/l), Pick up 85.8%, curing 175°C for 1 min.

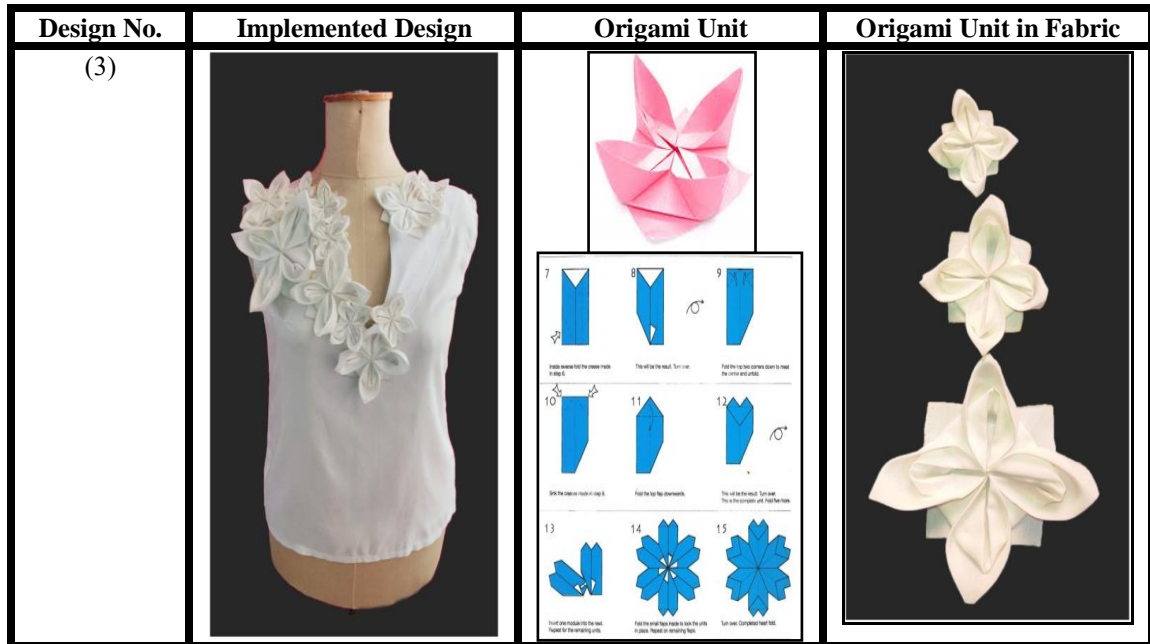
Type of clothes: Morning blouse Size 44.

Model description: It is a morning blouse made of viscose fabric with anti-wrinkle finishing in white color. this

design inspired from Butterfly origami units, in which the fabric was cut into rectangle pieces using laser according to the desired sizes. The unit steps were carried out on the fabric using the iron and stitches. The model is then formed on the mannequin, adapting unit lines to reach the desired design.

Artistic Analysis: Origami art contributed to the model decorative design. The structural basis of the design implemented on mannequin is the overlap, and intersection through the flow of origami units lines in different directions. The gradation in lines lengths, the spaces sizes and the folds created a state of kinetic communication, which achieves the rhythm. Balance was achieved in the distribution of the origami lines units and the areas resulting from folds, as well as the ratio and proportionality between the areas of the different intersections through design. The distribution of the origami modular folds helps to enrich the structural design and emphasizes the neckline with innovative lines. The refractions in the lines of folds helped to emphasize and highlight the spaces and define their relationship to each other. The areas of folds and refraction lines have played a major role in the unity and interdependence of design parts and composition unity. The refractions accompanying the lines of the origami units lead the eye from one area to another during the design, which achieves a sense of movement and dynamism in the design and achieves visual movement. The diversity of spaces created by the folds and their directions evokes a sense of movement. The diversity in the directions and lengths of the refractive lines gives an extension of the composition outside the framework of the design, which achieves dynamism and visual movement.

4.3. Fashion Design No.[3]:



Model No: 3

Fabrics types: 100% white viscose fabric (45/65 inch) of weight (115.6125 g\m) in all design.


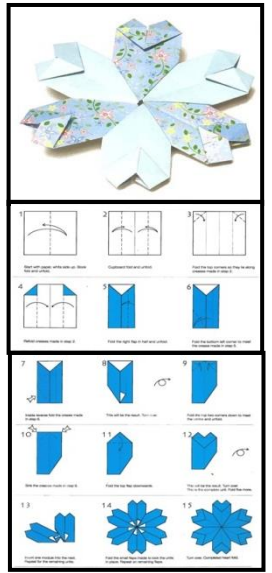

Anti-creasing finishing: DMDHEU (80 g/l), MgCl₂ (20 g/l), Silicon (30 g/l), Softener (30 g/l), Pick up 85.8%, curing 175°C for 1 min.

Type of clothes: morning blouse Size 44.

Model description: It is a morning blouse made of viscose fabric with anti-wrinkle finishing in white color. This design inspired from Water Lily origami units, in which the fabric was cut into square pieces using laser according to the desired sizes. The unit steps were carried out on the fabric using the iron and stitches. The model is then formed on the mannequin, with the units distributed in formal relationships.

Artistic Analysis: The structural basis of implemented design in style of design on the mannequin is juxtaposition, repetition and overlap through the flow of unit lines in different directions. The gradation in the units sizes and areas distribution gradation created a kinetic communication, which achieves rhythm in the design. Balance is achieved by distributing units across the shoulder and around the neckline. The ratio and proportionality between the unit's size, their area and the background was achieved. Decorative design with origami motives helps enrich and emphasize the structural design of the blouse, neckline, and shoulder. The aesthetic relations, the juxtaposition of units, their gradation, and their overlap helped in confirming and highlighting the forms and defining their relationship to background. The unit gave special effects to the viscose fabric and achieved a sense of three-dimensional spaces. The design elements in the model played a major role in the unity and interdependence of the design parts, which earned it the formation and balance of forms. textures varied from deep and prominent resulting from the nature of origami unit and the juxtaposition it with each other and the diversity of their sizes. The refractions associated with origami lines and their variety of straight lines and curved lines evoke a sense of movement and move the eye from one place to another within the design, which achieves visual movement. The contrast between the shape of figure and background evokes a sense of movement.

4.4. Fashion Design No.[4]:

Design No.	Implemented Design	Origami Unit	Origami Unit in Fabric
(4)			

Model No.: 4

Fabrics types: 100% white viscose fabric (45/65 inch) of weight (115.6125 g\m) in all design.


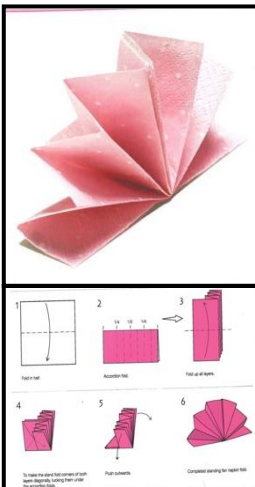

Anti-creasing finishing: DMDHEU (80 g/l), MgCl₂ (20 g/l), Silicon (30 g/l), Softener (30 g/l), Pick up 85.8%, curing 175°C for 1 min.

Type of clothes: morning blouse Size 44.

Model description: It is a morning blouse made of viscose fabric with anti-wrinkle finishing in white color. This design inspired from Heart Fold and Water Lily origami units, in which the fabric was cut into square pieces using laser according to the desired sizes. The unit steps were carried out on the fabric using the iron and stitches. Where the units were executed from the same material and color as the model, then the model was designed on the mannequin and the units were distributed in formative relationships.

Artistic Analysis: The structural basis of the design implemented in the style of design on mannequin is the overlap, repetition, and intersection through the flow of unit lines in different directions. The rhythm was achieved through the gradation of the units' sizes and their distribution, which led to create a dynamic continuity in design. Radiative balance is achieved by distributing units in the form of rays from a point on the center line. The ratio and proportion between the decorative design area of the origami units and the background was achieved. The ornamental design enriched the structural design and emphasized the midline. The formative relationships and the overlay of units helped to emphasize and highlight the shapes and determine their relationship to the ground. The design elements in the model played a major role in the unity and interdependence of design parts, so the unity of composition and balance of forms were gained. The refractions accompanying the lines of the origami units lead the eye from one area to another through the design, which achieves a sense of movement and dynamism and achieves visual movement. The contrast between the figure shape and the background evokes a sense of movement.

4.5. Fashion Design No.[5]:

Design No.	Implemented Design	Origami Unit	Origami Unit in Fabric
(5)			

Model No.: 5

Fabrics types: 100% white viscose fabric (45/65 inch) of weight (115.6125 g\m) in all design.

Anti-creasing finishing: DMDHEU (80 g/l), MgCl₂ (20 g/l), Silicon (30 g/l), Softener (30 g/l), Pick up 85.8%, curing 175°C for 1 min.

Type of clothes: Morning blouse Size 44.

Model description: It is a morning blouse made of viscose fabric with anti-wrinkle finishing in white color. Units in this design inspired lines and folds of origami unit from standing fan, where the fabric was laser cut into semi-circular pieces (cloche) according to the required sizes. It was equipped with heat stabilization to make radial plisse pleats, then shaping the model on mannequin and adapting the lines of the units to reach the desired design.

Artistic Analysis: The structural basis of the design implemented in design on the mannequin style is the overlapping, and repetition of the origami units through the flow of the units lines in different directions. The gradual distribution of units and their repetition led to create a dynamic continuum, which achieves rhythm. Balance is achieved by repeating the distribution of radial pleats in reverse along the design. The ratio and proportion between the decorative design area of the origami units and the background was achieved. The formal relationships, overlaying and gradation of units helped to confirm and highlight the shapes and determine their relationship to the ground. The design elements in the model played a major role in the unity and interdependence of the design parts, so the unity of composition and balance of forms were gained. The contrast between the figure's body and background evokes a sense of movement. The radial plissés helped give the swollen shape, as well as folds, undulations, protrusions, and a variety of deep and prominent, which gave a variety of textures. The pleated plissés in the decorative unit give more density to the fabric and achieve a sense of three-dimensional spaces. The refractions accompanying the ripples and protrusions of the origami units and the plisse pleats move the eye from one place to another through the design, which achieves a sense of movement and dynamism and achieves visual movement. The convergence and spacing of the plisse pleats in the origami units evokes a sense of movement and moves the eye from one place to another. The ripples and protrusions of the plisse pleats in the origami units contributed to obtaining shadow areas and light areas, and the diversity between them led to the achievement of movement in the design.

5. RESULTS AND CONCLUSIONS

The research reached the following results

- The most important results of the crease angle tests were summarized in the improvement of the crease angle value of the finished fabric, which reached (221.6), while the crease angle value of the unfinished fabric reached (162).
- Compatibility of viscose which finished against wrinkle in implementation of origami units.
- The effectiveness of origami art as a source of inspiration in implementing innovative designs in the style of design on mannequin.
- The effectiveness of origami art in achieving visual movement and the third dimension in designs executed in the style of design on the mannequin.
- The effectiveness of chemical and mechanical finishing in enriching the designs executed in the design on mannequin.

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