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Designing Multi-Functional Beeswax Modified Fashion Garments for Vitriolage Victims

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Abstract

Acid attack or vitriol attack is an instance of brutality which is also an act of slinging acid by targeting another person’s body to disfigure their face in order to harm or kill them. Moreover, acid attack is a social concern which can cause physiological and economic problems. According to previous studies, 80% of the victims all around the world are women by gender. Hence, the current study is based on designing a women's wear collection for their safety. However, acid attack victims can’t use all types of fabrics to cover their burnt body parts. Therefore, beeswax is used to design their dresses which further facilitates them with the healing of their bruises. The application of beeswax finishes on the fabric is beneficial due to its natural characteristics which include antimicrobial, antibacterial, antifungal, moisturizing / hydrating, and eco-friendly properties. The aim of this research project is to use both technology and art in designing floral and Zen motif patterns. The purpose of using them, as a source material for modifying and designing fabric, is to create an effective women’s wear collection. Furthermore, such collection is aesthetically pleasing and yields functional benefits to protect women’s skin from acid attacks as well.

Index Terms: beeswax finish, couture, multi-functional, vitriol attack

I. Introduction

A. Historical Background

The study based on Acid Violence was conducted about one century ago. Acid violence had been a solid social issue throughout the 20th and 21st centuries, which was further indicated in CEDAW, a committee held in 1992 [1]. Furthermore, honesty and ethical standards of textile designers and fashion designers with their profession was totally based on the rising

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worth of textile department. Moreover, this had been highly augmented in the recent times.

These professional masterminds had higher responsibility to understand the requirements of their customers. Also, to forecast the trends and at the same instant to stimulate them through their art and creativity. The current investigation would revolve around multidisciplinary maneuver with the implementation of respective modus operandi for innovative designs formation. Industries are in high competition in today’s world. The designers need to modify their conventional performance strategies into the modern one, so they can keep the designs, arts, and themes flourished.

B. Significance of the Research

The current study regarding Acid Violence and the use of fluorescence for their dressing has proven to be very effective, as indicated in many studies. In addition to it, this research is expected to boost up the modus operandi of the designers [2]. In today’s world, the technology has become so fast that helps to rebuild an outdated craftwork to retain their social heritage. The main aspect of these multiple cultures is to display their versatile social-contribution to the world. The successful and prosperous designers gather multiple facets of cultural, historical, and current views to upgrade their designs more appropriately. However, those designs and cut lines which are traditional as well as the part of current developments, create an extraordinary ornamentation and cut lines in the textile and fashion department. Although, significance of designing does not only describe its functions but also the values.

Hence, reanimating process of the technologies and finishes accomplished by giving different surfaces to boost it, would provide these designs more extent for their prevalence and trendiness. So, implementation with experimental color palette and new style would enable these technologies to become more practical in their usage. Furthermore, understanding the impact of social factors on product development can open the doors for designing a global marketplace [3]. As a fashion designer, the most important skill is to recognize and understand the nature of the problem and to solve it with an appropriate design strategy. The influences of social factors on fashion designers’ design practice can be understood particularly in terms of the design process. Furthermore, it may be worthwhile to investigate the social issues and the elements such as history,
philosophy, and world view along with it. Further it includes, the writings as well as paintings (base knowledge), in designing the creative product. Moreover, the fashion industry has proved to be remarkable in advancing the global business and fashion industry into the global market. Besides, creative design is one of the best solutions for this.

C. Aims and Research Objective

- Selection of suitable textile materials to design Multi-Functional Beeswax-Modified Fashion Garments for Vitriolage Victims.
- To experiment and illustrate the diversity of floral and Zen patterns, and techniques.
- To create practical textile objects by using an achievable framework.

This research aims to identify the characteristics of fluorescent fabric and their usage in the women’s wear industry. There are innumerable methods of making flowers out of simple fabric with the help of creativity minds and hands. Moreover, it can inspire the countless versions of three-dimensional works, a series of creations, and it also makes headgears to beautify the personality. The current research aims to make a bond between the technology and the fashion textile industry. Furthermore, to illustrate the design students with effects of social issues like acid violence, and also to glamorize the victim’s personality which is further grounded on their artistic and creative practices.

The current study examines 3D designs made up of technical beeswax-modified fabric with fluorescent finishing. Further, it extends the knowledge about the styling process of these embellishments on present day textiles. The use of floral motifs for embellishment symbolizes the nature and beauty. Moreover, it gives hope and desires to the victims. Basically, colors help in ameliorate and change individual mood. Fluorescent colors or neon colors are actually bold and ultra-bright colors palate for this project, which is tremendously bright genre of the primary and secondary colors. Fluorescent neon colors pump excitement and energy into the designing process. While the basic color palate would be soft and the combination of neon and soft color palate would further elaborate their sorrow and encouragement accurately [4].
Every color has its own psychological traits, that is, orange to excitement, green to freshness, and yellow to hope. Electric blue depicts calm and serene by corresponding pure blues. Whereas, neon pink represents the cheerfulness and fun (the characteristics of pink), and neon green shows the bravery and strong will-power which helps in achieving specific goals. In addition to it, the fluorescent colors haven’t always been affiliated with good taste due to its artificiality. While they have elegant status, so, they are associated with fun, lightheartedness, and plethora. This is also correlated with danger and warning. Throughout the current study, the terms ‘technology modified’ or ‘beeswax modified’ apparel would be used interchangeably.

The framework or conceptual project of the ‘creative design process’ was pointed out in this particular study, which further added to the already existed knowledge and literature. The current study was directly related to the relationship of how the fashion systems, technologies, and the process of creativity had an effect on the creative fashion design process. Furthermore, only a brief research has been conducted on designers during the creative design process. Therefore, the facts and findings from this particular study would probably broaden the knowledge of design education, global apparel industry, and design theory. ‘Acid violence is a dark issue’ means (it pushes victims to the dark). However, the purpose of this study is to give them glow in this dark situation with the help of fluorescence to the victims. The use of fluorescent fabric and glow in the dark fabric would be used in my collection as an embellishment. The current study aims to explore the deep relationship among fashion designers, cultural values, and the procedure of creativity in their design process.

Although, many industries are using different themes and designs over and over again in their business for the protection of acid victims. The product developments play an important and meaningful role in case of looking after the values. If recent styles and conventional designs get together, it would definitely extend the durability of these designs for future. It would facilitate an amendment in a field of present-day design developments, and would make more creative relationship between past, present, and future. Scrutiny will help juvenile (junior) designers to encourage their creative skills and to measure the innovation in rising technologies to boost up the individuals’ art and technical skills.
D. Scope of the Study

This particular research would analyze the sustainability and implementation of technology and designs as linkages. As, the applications of new versions and styles in today’s world demand design practices. Moreover, the current research would evaluate the inter-relationship between the technical and hand-crafted design techniques. The present study would more ameliorate the developments of designs on textiles.

The focal point of the current study is to analyze those issues which are pertaining towards acid victim’s clothing, examine carefully, and draw up a variety of limitless designs. The present research project concentrates on different cutline products of women’s wear, which are full of handcrafted, functional, and feasible nature (experimental). However, utilization of different modus operandi makes their effort meaningful. The main intention of this project is to incorporate technical textiles to develop Haute-couture yet wearable for persons with special needs (acid attack victims). Smart Textile Technologies offer new means of expressiveness and functionality to share the importance of Beeswax finishing in textiles to the public.

The current study proposes unparalleled variety of designs, which were never viewed ahead. This would be associated with the future trends of the market. Furthermore, the main focus of this study is to captivate a persons’ attention with its unmatched design development and fabric manufacturing with the implementation of various methods.

Moreover, this project would give awareness of technical fabric manufacturing for acid victims and the methods of development and utilization in daily life for sufferers. The current study has been using a fusion of concepts like 3D forms, Zen tangle art, and fluorescence [5]. Major motive behind this particular thesis is to give hope and confidence through fashion to the acid victims to move on from their despondent phase. Further, Zen-tangle art drawing is a form of art that gives mind relaxation which contains different shapes and patterns tangling up to make beautiful images. These tangled patterns are called “Elemental strokes” [5]. The artwork contains illustrations, pattern design, draping, mocking, fabric sampling, fabric manipulation, digital prints as well as embroidery and embellishment sampling. The current research has shown a tendency to take a look at the value and identity of women in the world by increasing awareness of gender issues.
E. Definitions of Key Terms

1) Fluorescence:

A fluorescent substance does not glow in the dark, but does glow extraordinarily under black lights. When fluorescent paints react to the long wavelength ultraviolet (UV) radiations, this process is commonly known as ‘black light’.

2) Beeswax:

The natural wax is prepared by honey bees (species Apis mellifera and Apis cerana). It is produced with special wax glands which are consolidate in scales. Although, they get in touch with the air by worker bees (age duration between 12 to 18 days). Initially, it remains colorless but after mixing with honey and pollens it becomes yellow. It is a complex product (including more than 300 components) which contains hydrocarbons, esters of fatty acids, and several long-chain alcohols, along with the diesters and exogenous substances chemically. These are actually the components combine to build the honeycomb, where honey bees can store their honey. Furthermore, it has multiple remedial properties due to its antimicrobial feature, that is, really beneficial in curing itchiness or rashes, wounds, skin swelling. Besides, it also cures a burning sensation, fractures, treat heel cracks, and to soothe joint pain. The usage of mixture of honey, beeswax and olive oil has substantiated to be very efficient for the treatment of diseases.

3) Zen Tangles Art:

The definition of word “Zen” is to feel peaceful and relaxed. Zen tangle is an easy to learn type of art, which is a process of ‘self-help art therapy’ implementation to enhance a person’s focus, their convenience, and self-confidence. It is a mature category and elegant metaphor of art used by psychologists to comfort their patients. It usually includes freehand doodling which is a fun way to bring into being beautiful images by drawing repeated structured patterns. However, these patterns are patch up in mosaic manner and called tangles which is further an inexpensive type of abstract art and also called “modern meditation.”

Although, it assists us to organize an internal non-linguistic language of segment and patterns which open the ways towards new consciousness that is usually head off from our acknowledgment.
This art is an "elegance of limits", non-representational and unscheduled, and too much similar to life (because life itself is an art manifestation), for example:

- While drawing art, each mark has been kept deliberately on purpose.
- As there is no eraser to remove life events, similarly there is no eraser while drawing this art. Nevertheless, if there is any expected mistake, then drawing new patterns on that point by erasing the old mistakes can make new directions.

There are no mistakes in Zen tangle, so there is no need for an eraser. If you do not like new look of a stroke you have made from mistakes, then remains only an opportunity to create a new tangle, or to transform it by using an old trusty pattern. A Zen tangle tile is an unfolding surprise before the creator's eyes that one strokes at a time [6].

4) Elements of Art:

There is no rule and regulation while drawing this art but consequences still can be amusing.

II. Review of Related Literature

The fields of fashion and textile designing have economic, social, and cultural impacts on individual personalities as well as the society. This culture system started with our ancestors and has been passing on to our younger generations since then. Hopefully, it would continue to pass on to the coming posterity.

A. Environmental Discourses

Although acid attacks occur all over the world, and it is not confined to a specific gender, age, religion, caste, or geographical place. Acid attacks violence has always targeted women of the society to control them and silence them. This is a gender based odious offence usually against women. Besides causing emotionally protracted sufferings and psychological shock/trauma, vitriol attack (Acid Attack) leads to an acute pain. Furthermore, it has perpetual disfigurement along with the temporary or permanent disability, and permanent scarring of body. Later on, the infections can oftentimes result in the blindness of both eyes as well as it can also cause the eye burn. It can lead to long-standing and devastating medical complications for the victims. However, death can be a consequence of the instantaneous effects of the burns caused by the intense attack. Moreover, a
report was published by WHO in 2011, which indicated the multi-organ failure because of the acid attacks on subsequent times [7]. The after effects of the severe burning depend upon different body parts that has been intended to attack. Most often, such attacks are intended to attack on the face and head as main parts of the body.

The survivors avoid social interactions mostly and according to the survey, one third of survivors may endure depression, nervousness, post-traumatic stress, and anxiety. Suicide may occur owing to badly psychological, economic and emotional sufferings, and physical malformation and disproportionate impact. Moreover, the survivors faced some other problems after attack, like their out-casting from the society, employment, and less possibility of their marriage to occur. It is basically a crime of personality demolition, in which victims have to learn to live with their disparate, burned, and disfigured faces and bodies. The intensity of their damage also depends upon the concentration of an acid.

B. About the Acid

Mostly, sulfuric (H₂SO₄), an oil of vitriol and nitric acids (HNO₃), were utilized during vitriol attack (Acid Attack). H₂SO₄ is an extremely strong chemical having poisonous nature. In some cases, Hydrochloric acid (HCl), is also used; however, it is far less harmful. In some instances, especially if approach to acids has been confined, strong alkaline solutions for example sodium hydroxide (NaOH), also known as caustic soda may be used as an alternative. These chemicals are easily available because of their use in rubber, carving marble nameplates, and cotton and jewelry industries on inexpensive rates.

However, caustic substances may also be consumed in suicidal attempts. In these attempts, due to the caustic burns like perforation in upper gastrointestinal tract or hemorrhage lead to sepsis or multi-organ failure causing eventually Death. Nevertheless, these cases are undoubtedly different to corrosive assaults.

According to Acid Survivors Trust International (ASTI) statistics [8], 75-80% of the acid attacks and burn sufferer are females over the globe. Furthermore, it reflects the immortalization of the women's position and gender inequality in the society. On the other hand, males are the usual victims in United Kingdom (UK), Greece, and Indonesia as a consequence of gang-based activities. The percentage of acid attacks on women has
enhanced, fundamentally in the age of 11-30 years on daily basis in which, 40% victims are under the age of 18 approximately.

C. Beeswax-modified Textiles

Beeswax finishes have been applied extensively to different textile products in the recent times. Owing to the multiple benefits it yields, the beeswax not only provides the anti-microbial and antiseptic properties but also gives a very smooth finish to the garment by making it very comfortable in its further use [9].

D. Historical Background of Zen Tangle Art in Fashion Design

Zen tangle is an American modus operandi for drawing. The developer of this art was a monk named Rick Roberts and an artist named Maria Thomas. With Zen tangle they bring into being a fusion of consideration and art. A designer Bibi Russell made collaboration with NGO ActionAid’s and beamed light on the victims of acid attacks by “Survivors’ Runway”, a fashion show in London [10]

1) Benefits of Zen-tangle Art:

This art provides the following benefits.

- Relaxation
- Anger management
- Self-confidence improvement
- Soothing stress
- Restocking sleep
- Modern meditation

III. Product Development Methods

A. Product Execution Strategies

The base of every garment would be kept in soft color and the 3D embellishments on fabric and accessories will be of fluorescent fabric. Overall, the current study represents journey from stress and low confidence to flow hope. Every garment in thesis project portrays healthy feeling that is essential of a cheerful life to move on. Every garment occupies all creative elements like complete silhouette, 3D with different color schemes along the Zen-tangle art embroidered touches done during study time period. Fabric texture has been selected attentively, in respect to avoid the
harshness in collection. In addition to it, it also gives a soothing effect to the survivors, soft fabric like classification of cotton, and cotton blends with silk have been used. Collectively, garments express the feeling of calmness and relaxation.

Furthermore, the color palate, fabric type, and patterns picked keenly to give soothing effects to the survivors. Data analysis and utilization of the different techniques, the mechanism of gathering information would be discussed in the current study. This study used as source of encouragement which plays an important role in development of design. The research to develop the desired clothing line includes an art, finishes on fabrics, a social concern, and 3D forms amalgamated to give expectations from the life and trendy feelings. The whole framework includes the concepts board, mood board, research boards, drawing boards, embroidery and embellishments, different textile surfaces like block or screen printings, weaving, applique work, and others.

B. Descriptive Research Design

The analysis of research design description is conducted thoroughly to collect the informative data. The investigation about the present topic gives a complete background history, utilization and significance of functional, and the representative elements for further developments. Design elements were collected intensely from the meaningful sketches, conceptualized drawings, photo shop prints, hopeless declined features, handmade Zen-tangle art doodling, and 3D shapes with energetic and soft colors. These designs are transformed little bit in the form of embellishments, embroideries and framework with crystals, thread and beads, and different fabric manipulation experiments to generate the shapes and forms on the surface of the garment. Soft fabric like Pakistani raw silk, pure cotton also presents every garment’s story. Color palate is the main element to give prominence to consideration. Zen tangle art doodling has done by free hand and digital prints on adobe Photoshop. Some work has done manually, some digitally, and some about mix media. Zen tangle designs are solely utilized for making contact embroideries in garments, to strengthen the self-confidence and sense of prosperity.

C. Design Development

The development of a design is one of the main steps for a designer while working on any theme. Furthermore, this can be helpful for a designer
Designing Multi-functional Beeswax…

to create new designs for the final product. The design development is derived from research board to create new motifs; these motifs are helpful for development of the embroidery and embellishments on jewelry and dresses. The major design techniques which are used to develop this collection are:

- Embellishment
- Embroidery
- Fabric burning to get texture
- Mix media 3D concept boards
- Digital prints via Photoshop
- Draping and pattern for mock garment
- Woolen thread and silk thread embroidery
- Fabric manipulation
- Dying Procedure
- Applique work
- Trap-unto (A special quilting in this extra padding is added to create a raised and relieved Surface)
- Water color in fashion illustration
- Adda work

Initial paperwork includes constructing the Research Boards, Mood Boards, Concept Boards, Digital Prints, Patterns, and Drawing Boards. All of the above work has been done according to the theme. Moreover, Mood boards are created to show a perception of theme, to portray the look, and color scheme of the theme. Reviewing the mood board helps everyone in understanding the topic and their outcomes. Sometimes, mood board is also known as inspiration board because it has inspirational elements related to theme which can help a designer to create something new for their design projects. Mood board depicts the main idea of the designer.

Colors play an important role in life of a designer and it attract the viewers. Color palate board contains dominant, sub dominant, and accent colors. It is actually the color scheme which is further selected for the theme or showed by theme itself. This color palate board helps in color scheming about garments, embellishment, and embroidery. In this collection, there is a combination of soft and neon colors which helps to get rid of sad life.
Research analysis play a fundamental role in fashion industry. It is important to forecast that how the final product will acquire the viewer’s attraction and customer’s glance. The concept boards are created to visualize the customer’s interest who further predict few of the elements of theme. However, it is a story within itself and the concept boards are created digitally, manually, and through mix media. Anyhow, the drawings boards are created manually and they also help to portray and explain the customary designs and elements further in detail. Hence, the current study created two drawings boards containing both the Zen-tangle art patterns and other elements of themes.

The current research shows that every fabric is not comfortable for the acid survivors. However, there must be soft fabric for their collection whereas, cotton and some silk types are suitable for them. Fluorescent fabric is required for embellishment to make flowers for 3d forms. Since, in this particular study the utilization of fabrics is accomplished according to its requirement. Eventually, my overall collection is not edgy and gives a soft and lenient look.

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Raw Material</th>
<th>Mass Per Unit Area (g/m²)</th>
<th>Thickness, (mm)</th>
<th>Porosity (%)</th>
<th>Apparent Density (g/cm³)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prototype 1</td>
<td>Polyester 40% Cotton 20% Viscose 40%</td>
<td>280</td>
<td>0.88</td>
<td>78</td>
<td>0.32</td>
</tr>
<tr>
<td>Prototype 2</td>
<td>Polyester 100%</td>
<td>164</td>
<td>0.36</td>
<td>67</td>
<td>0.45</td>
</tr>
</tbody>
</table>

Both the cotton and blended fabrics used in this particular study contained only dyes with no chemical finishing agents.
D. Product Manufacturing Process

For modification of designs, 60 rough sketches were designed according to the theme. Cut lines were made according to the significant fashion elements of theme with the help of Research board. These sketch illustrations were made just because to understand the whole process till final product.

Out of 60, twenty sketch developments were selected. Subsequently, those selected rough developments were illustrated properly with their watercolor techniques of each garment.

Then researcher has selected 5 to 6 illustrations for the final design products. Furthermore, more amendments were made in selected illustrations and were cut off by advisors attentively. In addition to it, finalize garments have to be final product on the basis of modern trendy cut lines, after the design developments and illustration’s rendering. The formation of technical drawings of final selected product is the most controversial step. The final exhibition of the current thesis includes two different types of dresses which are inspired by forecast for acid survivors. Furthermore, all of the details about embroidery and embellishments, dart and seam allowances, are drawn properly in technical drawings. Each Textiles surface of garments has their own concept behind and both the garments have their own color schemes. Those selected illustrations are designed on the rough calico as mock (Sample), which were meaningful while stitching original final products. Mocking process is performed by the pattern and draping on mannequin with proper measurements. Hence, the purpose behind is to get perfect fitting measurements for original garments and permanence of design on dummy or mannequin. Each garment is disparate from one another due to variation in their lesson, style, and fashion.

E. Incorporated Beeswax Application Process with Florence and Zen Tangle Art Forms

Although, Beeswax was used for the finishing of garments which was made of cotton, polyester, and polyester/Cotton/Viscose blend fabric. These garments were designed with Florence patterns ornamented with Zen tangle art forms. Anyhow, it was observed that modification of fabrics with beeswax provides them with biocidal properties. Moreover, it was against the molds to prevent bacterial skin infections which was a great concern for
the acid attack survivors. Beeswax imparts a pleasant surface smoothness to the textiles, which further confers a silky gloss by adding an excellent, smooth and, soft textile surface [11]. The treatment imparts improvement of the sew ability and the process improves the technological properties of the fabric as additive for easy-care finishes.

1) Prototype I:

It is a one-piece garment. The first garment of proposed collection is knee length top, which is loose from bodice and is open from the central front line through buttons. There are two further pockets to keep hands in them on front side and these are called box pockets. One of them has an embellished surface. There is an extra panel at shoulder side, which is embroidered with Zen tangle pattern. This panel is closed in sleeve and shoulder seam allowances properly. Neckline is simple round. Sleeve of this garment is reaching at elbow level. There is a belt with an embroidered buckle that helps to maintain fitting on waist level. Besides, it maintains the sustainability of ease at bodice level. The total number of garments are made up of the winter cotton fabric.

![Prototype I](image)

*Fig. 1. Prototype I*
2) *Prototype II:*

It is a two-piece garment. 1\textsuperscript{st} piece is bodice loose dress having wide neckline and length up to 7cm downward from bust line. It has one mutton leg sleeve on left side. This is loose from front and there are two knots in opposite side of the sleeve. First one knotting is done at shoulder level and other one on right side at waist level. 2\textsuperscript{nd} piece of this garment is trouser, a blind zip on left side. There is an extra panel (cascade) place with buttons that starts from the belt level of right side and wrap it on left leg from front and back. The hem of left leg is of flare bell bottom shape and right leg hem is of basic measurements. This cascade has a doubling functional. It can easily be removable by buttons. There is an embellishment at bodice top. The whole garment is made up of Pakistani raw silk and other types of silk fabric.

![Fig. 2. Prototype II](image)

**IV. Conclusion and Future Recommendations**

The variation in trends and remodeling in fashion have been occurring since ages in the fashion industry. Moreover, a designer should design such products which can fascinate the customer and captivate the attention of
beholder. In order to survive and sustain itself in the market; a designer have
to create an artifact which is utterly distinct in every respect. Besides, it also
makes others acquainted with the designer’s innovativeness and creativity.
Furthermore, multiple market analysis and surveys are organized in order
to measure customer demand and to fulfill their requirements. In addition
to it, a designer should have acquaintance with forthcoming designs, trends,
techniques, and technologies. The works during this thesis have done by the
implementation of a combination of an old and latest technique against
social issues. The current thesis was conducted by amalgamating
conventional and modern techniques, contrastive of social issues. In near
future, competition will arise in fashion industry with upcoming newest
trends. Hence, being a fashion designer, it is essential to understand that
fashion does not only reflect glamour but it also has a place for all forms of
expressions and sentiments.

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