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Application of Laser in Production of Textiles Using Abstract Patterns

Azita Akhtarian[a], Abolfazl Davodi Roknabadi[a]*, Salar Zohoori[b]

[a]*Department of Design and Clothing, Yazd Branch, Islamic Azad University, Yazd, Iran*
[b]*Department of Textile Engineering, Yazd Branch, Islamic Azad University, Yazd, Iran*

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Abstract

In the present era, neglect of basic skills and updated technologies in the field of art has decreased progress and performance. That's why superior technologies can play a vital role in the development of art. Laser is one of the technologies used to cut a variety of materials, including textile. Laser has sufficient power, precision, and high speed through the accumulation of energy and motion in a straight line. One of the applied arts in the field of textile design is the art of cloth making. In this article, textile fabrics are made by lasers in order to enhance the precision and speed, as far as the efficiency and quality of work can be promoted. Moreover, in art section, abstract art is used in order to create designs on fabrics, and abstract designs are provided using laser. Eventually, clothes were produced using abstract designs, and with the help of laser and textile making.

Keywords: Textile Making; Abstract Arts; Laser; Clothes Design

1. Introduction

In today's world time plays a significant role in human life, where they try to achieve their thoughts and ideas in the shortest time and with the highest speed. Therefore, it is important to have some information about industrial tools and time optimization methods. In this project, having information and familiarity with tools, as well as instructions of the tools can be regarded as an essential process which should be learnt step by step; therefore, the importance of the issue led to case studies and primary experiments.

* Corresponding author. Tel: +98-3531872495; fax: +98-3538215200.
E-mail address: davodi@iauyazd.ac.ir.

In the world of textile and clothes design, designers are always seeking new methods for textile and clothes production in order to respond to the needs of those who are involved in the temporary market of style and fashion. Therefore, different and special methods are used in textile designs which are continuously optimized in the production of textile, production time, use of materials, color diversity, and so on. As a result, if novel methods are not used, we will face a long path which is time consuming. Therefore, using plants and novel methods such as digital printing, cutting tools, laser, and so on, along with combining abstract patterns can be considered as a new step in textile and clothes design. Laser is performed by irradiation on the objects which are desired to be cut, and its combination with abstract patterns can make new patterns. Abstract patterns are generally those without any corresponding natural shapes or figures in the real world, which use metaphorical and unnatural colors and forms to express concepts. Therefore, the present study aims to take a new step in textile making, with the help of laser, its tools, and its combination with abstract patterns.

Textile and leather printing with laser or laser engraving on fabrics and leather has found numerous applications in the textile and leather industry for its multiple benefits. In the process of making leather products such as bags, shoes, gloves, different leather clothes, wallets, furniture coverings, and other expensive products, the surface of leather can be engraved. At present, metal frames are almost used to design the above mentioned patterns and this method is usually based on the producer's name or logo. However, laser can be used to engrave complex designs on leather. Moreover, laser can be used to engrave various delicate and sophisticated designs in textiles. This kind of engraving is impossible with traditional methods and only laser plants can do it. These plants can be used in the production of different cloth labels, decorative textiles, and toys in which textiles are applied.

2. Textile Making

Initiative, creativity, and unconventionality are required characteristics of the fashion industry, and creation of new fabrics using recycled and waste materials is one of the most innovative practices in today's fashion world. In the production of single and unique clothes, designers usually use techniques which create changes in the appearance of the textile, so that it is not similar to what is sold in the market. Textile making gives designers endless possibilities to create different clothes. Given that these days, people seek unique clothes which don't have any counterparts, textile changing leads to the differences among garments.

Different techniques and various materials such as yarn, threads, nets, guipures, suede, leather, metals, metal fibers, recycled materials, and so on can be used in textile making in order to create a new pattern. These new textiles are used for the production of different clothes such as dresses, scarves, bags, shoes, etc., while they are also applied in internal decorations, pendants, decorative boards, table coverings, and so on. Designers don't use textiles directly, due to the use of hand stitching, such as needlework, hand prints, and so on. Moreover, performing greet which means changing the textile is another way to give forms to it. In this method, small stiches on the textile give regular geometric shapes such as flowers or, conversely, irregular and wrinkled shapes.

Unconventional methods in using textiles give novel appearance to the clothes. The textile can be changed into a volume by folding it up, putting a few layers of it together or cutting and stacking up some of its parts. One type of textile making, which is familiar to many, is sewing pieces of fabric together and then preparing clothes from the resulting textile. This is known as forty-piece sewing and has been evolved in Europe since long time ago in order to use old clothes again; however, it is now done with new textiles (www.tar-o-pod.com).

3. Laser

The term “laser” which is an acronym for “Light Amplification by Stimulated Emission of Radiation” was first introduced to people in Gould's 1959 conference paper. He referred to “laser” as a suffix which could be used for light spectrums radiated by the device. No other terms were common except “raser” which was used for a short term to refer to radio frequency emitting devices (Hatefi, 2002: 35). Before the discovery of the laser in 1960, the concept "death ray" was familiar to readers of science fiction. However, today the term “laser” gives the same impression to people, and now lasers have many applications in the real world. They have made their way into factories, shops, offices, and even our houses in different ways. In simplest terms, the laser can be described as a source of light or radiation. However, the laser has many special features that distinguish it from other light sources such as the sun, candles, electric lights or fluorescent lamps.

The amount of energy that a laser can emit or radiate depends on its constructing material. Materials can be used in all states including gas, liquid, or solid, and at temperatures in the range of minus 100°C to several hundred centigrade degrees. Therefore, lasers can take different forms and sizes. They may be smaller than a point or they can be so big that some acres of buildings will be needed to include them. Although there is a wide variety in lasers, all of them work based on the same principle (Arvand, 2006: 23).

Energy radiation of light sources is known as “power” which is measured with watt. Obviously, selection of required laser depends on the amount of energy or watts needed for the work and the amount of available space. In some usages such as cutting steel sheets of welding metal sheets together, requires huge powerful lasers. On the other hand, these lasers are not suitable for delicate works such as eye surgery or reading laser disks in video devices. Most telephone lines between major cities are now connected with the help of lasers and optical fibers that are smaller than a pinhead, and are considered as signals sending information. These lasers are not suitable for welding (Taylor, 1996: 12).

During the 26 years of laser discovery, great achievements have been made in science and industry. Since laser features can be controlled with great precision, they can be applied for measurements which are impossible using other light sources. Moreover, they have hundreds of usages in industry and even in our daily life, although a relatively small number of people have clear background on the manner it is used and applied (Rajabi, 1996: 1).

4. Abstraction

The term abstraction in visual arts refers to sterilizing, summarizing and simplifying the form. The concept of abstraction from the perspective of "Paul Cézanne", father of Cubism: all constituting components of our surroundings can be eventually simplified into cubes, cylinders, spheres and cones which are squares, rectangles, circles, and triangles in 2D view.

4.1. Abstract Art

Abstract art refers to an art in which no natural shape or appearance of the world can be identified, and the art uses only metaphoric and unusual colors and shapes to express concepts. This term is usually used in figurative art and in its broad meaning can be referred to any kind of art which doesn’t represent identifiable events and objects. However, it usually refers to modern art creations which reject any imitation of nature or simulation of it as it is commonly used in European art. In early 20th century this term was mostly used for art schools such as cubism and

futurism, since nature was expressed in simple or exaggerated forms – only an image of the original natural subject. In the paintings of these styles the most important issue was usually to record and narrate objects' realities and not necessarily their appearance. According to historians of modern art, Kandinsky was the first painter who produced completely non-expressive art around 1910, and then modern abstract art was expanded in different movements and art schools (Chilverse, 2001: 37).

An abstract work is a painting or sculpture which does not represent any individual, location, or object in the real world (even exaggerated and out of form). In this regard, the work is called exactly by what is seen in it: color, form, effects of brush, size, scale, and in some cases work process (Edward, 2005). Ever since humans began to create any work of art, their minds have been in a conflict between reality and abstraction within the framework of their works. Abstraction is one of the most basic principles in creation of artistic works, which can be observed in the works of different eras, from the caveman's time (such as those obtained from the Neolithic caves of southern France and northern Spain) to the works of modern times and trends in post-painterly abstraction.

Abstraction refers to specific mental work in psychology and philosophy. This mental work includes comparison of things after the mind understands similar items. Then from the shared feature, each object is put aside and the common feature is selected. Here, it is said that this concept makes the overall concept which is true about all objects, and is an abstract or is shown in an abstract sense (Asghar, 1995: 33).

Distinguishing aspects which make differences between humans are put aside and the common aspect is selected. Now, humanity is an overall concept true for all of them. Therefore, it can be said that humanity has been abstracted while they have distinguishing features specific to each of them (Hosuri, 1992: 6). In the same way based on what was said, it seems that abstraction refers to an overall concept which has been abstracted from external manifestations. For example, human and animal concepts are abstract. These concepts cannot be indicated in the external world, but the mind understands them as it was mentioned before. Overall, abstraction is a mental work and activity by which the mind can extract concepts from the external world, and is in turn called abstract (Reed, 1995: 11). This term can be referred to any art, in its broadest meaning, that doesn't represent identifiable objects or events, it rather refers to those modern art creations which are free from imitation of nature or its simulation as it is conceptualized in European art.

5. Process of Practical Work

It was necessary to investigate abstract patterns before starting practical work. Patterns were designed to the basic level of etude using books and figures of abstract patterns. Given the features of laser devices, which create no limitations on cutting of delicate patterns, designing can be done freely while exact and delicate details are considered.

Different patterns were created using abstraction, and the eventual patterns were confirmed and selected according to the opinions of experts. First, each pattern was selected from one or some motifs and then newer patterns and various combinations were obtained using different combinations and arrangements. Laser device reads vector and coded patterns and then starts cutting. Therefore, each confirmed pattern is entered into computer and is vectored using Ai as well as Corel Draw program.

6. Practical Implementations

6.1. Pattern 1

Examples of vectored patterns: Combination of one or some motifs to obtain the final configuration. In this case, the single motif and design of flower (in order to achieve the required composition) and laser cutting on fabric is used for integrating applications, including sweatshirts.

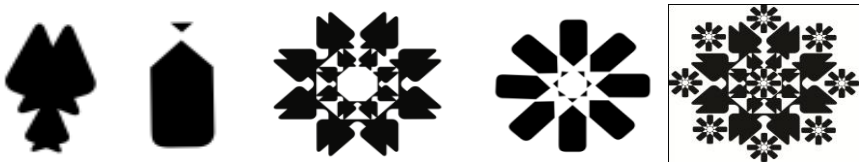

Fig1 Example of vectored pattern components

Fig 2 Example of vectored pattern components

6.2. Pattern 2

Examples of vectored patterns: In this example, a single flower with abstract patterns and designs with the new composition of the fabric was used as the margin.

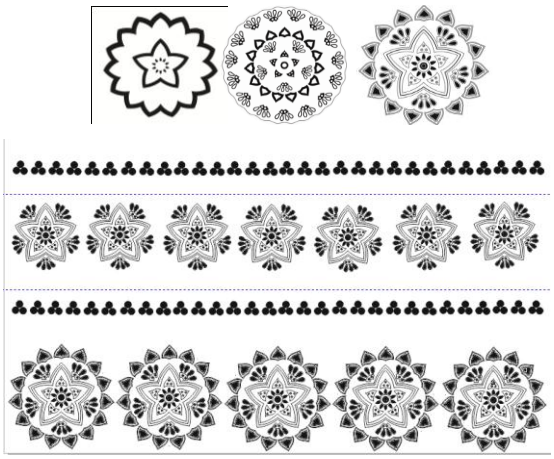

Fig 3 Example of eventual configuration

Fig 4 Eventual implementation of pattern 2

6.3. Pattern 3

Examples of vectored patterns: In this example, the abstract motifs and design elements are used. All the different motifs eventually integrate to achieve the required composition of fabrics for sweatshirts with different clothing designs.

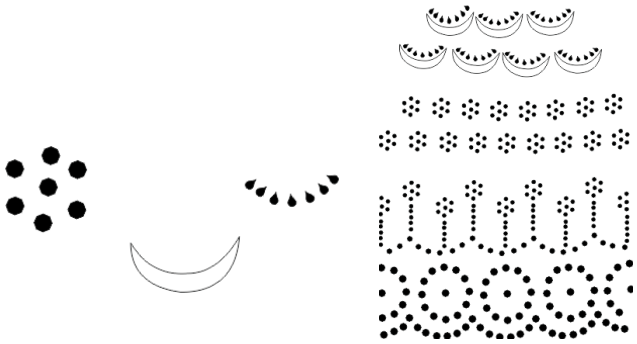

Fig 5 Example of vectored pattern components

Fig 6 Eventual implementation of pattern3

6.4. Pattern 4

Examples of vectored patterns: In this instance, various forms combine with different sizes and ultimately achieve the goal of integration with the aim of creating abstract designs.

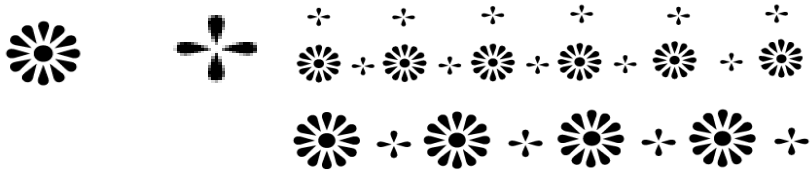

Fig 7 Example of vectored pattern components

Fig 8 Eventual implementation of pattern 4

6.5. Pattern 5

Examples of vectored patterns: In this sample, the elements and principles of composition are used for marginal motifs on clothes and deployment projects in different parts for sweatshirts; beads are also used as a belt in front of the sweatshirts to eliminate simple fabrics.

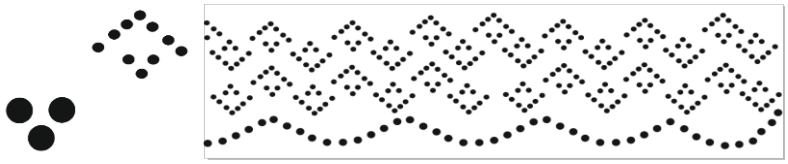

Fig 9 Example of vectored pattern components

Fig 10 Eventual implementation of pattern 5

7. Conclusion

In this study an attempt was made to apply laser as an up-to-date technology, along with its speed and high precision in order to create abstract patterns used in textile making. In this study, textiles used were not self-burnt or burnt by laser. Dresses and skirts were prepared with the textiles' designed patterns. Finally, designing of the textiles was done with great precision so that the resulting textiles had a high quality.

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