Textile Pleats as Timeless Beauty

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Abstract

Pleats are folds formed on a piece of fabric. The related terms have differences according to the language. Characteristic of pleats, the texture, is one of the essential elements of design, which principles are important aesthetic tools and the means by which designers can subtly adjust spotlight and effects on the clothing. The focus here is on manual and semi industrial techniques. The patterns range from simple as knife pleats, to complex, such as tessellations. Inspirations and influences have origin in history and traditions.

Keywords: Pleat, textile, tessellation, texture, design, fashion

Introduction

Pleats belong to the field of fashion and clothing, considering design, its principles and their applications on fabric.

According to Treptow (2013), "fabrics are the fashion raw material". Through them, ideas are transformed into apparel design products. Dior (2009) said: "fabrics do not only express the dream of a designer, but also stimulate the ideas". They can be a source of inspiration and many of his dresses were born from the fabric inspiration. Jones (2009) states that"the fabric or the materials from which the clothing is made can determine the success or failure of a style that looked good on paper." Many designers choose the fabrics before creating a piece or a collection. They prefer to be inspired by the texture and material handling and then, look for something that has the perfect fit for their design. The fabric is chosen by compatibility with parameters such as season, desired lines, silhouettes and average price for the target market and color. The color can be adjusted at a later stage, but the texture and other properties remain constant.

The design principles in fashion, is the mean for creating new arrangements for known elements. The designer talent lies in using these tools in unique combinations that encourage consumption. Jones (2009) states nine design principles: repetition, rhythm, gradation, radiation, contrast, harmony, balance, proportion and bodily sensation.

"Creating is a matter of mixing elements in an exciting new way to generate combinations and products" (Jones, 2009). The design elements of fashion creation are silhouette, line, proportion and texture. The silhouette is the general contour of the clothing that changes according to the observation angle as by the body movements. The line, used in endless variations, in many directions, hard or soft, promotes emotional, psychological and aesthetic reactions, emphasizing or concealing the features of the body. Proportion is the way one visually relates all the separate parts to the whole. Treptow (2013) stated the relationship between body and clothing not just as visual, but also sensorial. Textures are important due to that factor. The designer should be familiar with the properties of different fabrics. Many ideas may be conveyed to paper or computer screen, but if it is not chosen the ideal texture (weight, touch, composition), the desired result will not be reached.

Pleats present principles like repetition of lines and patterns, rhythm, texture contrast, radiation as in *soleil* pleats. The bodily sensation provides the tactile experience. Contrasts of texture emphasize the differences between the clothing, the body shapes and the skin itself, adding style, mood and charm to the look.

Concerning to terminology, pleats, folds and other ones, Wolff (1996) classifies the group of textures as systematic folding, compounded by pleating, smocking and tucking. She defines pleats as measured folds formed at the edge of a piece of fabric where they are secured by stitching. Beyond the stitching, pleats become loose folds that continue the arrangement set at the edge. These folds can be manipulated to project themselves giving new and attractive settings.

Dior (2009) has said that for years, the pleats are, and will continue to be a high fashion point. He loved them because they are feminine, effective, and give movement. They always provide a visual simplicity he greatly admired. They are very cheerful. With the pleats, you can put the ease in a dress without making it stuffed. They are very slimming and look good on almost all women. They are also very versatile. You can have box, accordion, not pressed, inverted folds and *soleil* pleats - and all of them have their use.

Pleats, *Plissé* (French) *and Plissado* (Portuguese) are considered as a series of small folds in great number, made in a fabric, usually by machine to fold them. Thanks to the action of heat or chemical process, the effect is preserved. Thermoplastic fibers in the composition determine the permanency of the pleats. In natural or animal origin fibers, as silk, dry washing is recommended otherwise the effect may be partially or totally lost. That is usually done by specialized companies.

Pregueado (Portuguese), also named as pleats and *plissé*, refers to fewer number of folds on a fabric, manually made, stabilized by stitching and sometimes iron pressed.

Pleats and its variations are characteristics that deserve to be used, exploited and extrapolated.

In order to maximize its use, it is fundamentally important to consider aspects of design.

Methodics and Analytical Methods Used

Exploratory survey by:

• Bibliographical research;
• Concepts relationship analysis - design elements, fashion design, craftsmanship and production processes.

Contemporary Japanese Fabrics

Exploiting tradition, according to McCarty and McQuaid (2011), the textiles are among the oldest and most pervasive art forms. They integrate people's lives in countless ways and can be made of any material; they keep on giving artists and designers, opportunities for imagination and inspiration. Contemporary Japanese textiles, with some of the most ingenious and dynamic artifacts being made today, reaffirm this commitment.

Textile activity includes primarily, art, interior design and fashion. Many of the artists employ traditional weaving and dyeing methods on natural or synthetic materials, to obtain exclusive shapes, which are flat or sculpted. In contrast, textile designers collaborate with dyers, weavers and manufacturers, using complex technologies and complex manipulation techniques to create new textures, finishing processes and extraordinary visual effects that are reproduced industrially afterward. Their textiles are used for residential and commercial interiors, fashion and practical applications. All these works, however, are a natural consequence of the rich Japanese traditions in spinning, dyeing, weaving and finishing by fabric manipulation. Throughout its history, the Japanese people have shown their great sensitivity and love to nature and its beauty. The worship and communion with the spirit of nature comes from Shinto, a Japanese indigenous religion. By the scarcity of natural resources, this people have a high respect for all materials, natural or synthetic. An ability to maximize limited resources and honor the inherent characteristic of each material is deeply rooted in Japanese culture. Despite the large factories are technically modern, automated, most of them are small and simple. Many of these factories used to make kimonos and other garments, and have existed for generations. Each tends to specialize in one technique - cutting, chemical etching, wave-reed loom, pleating or flocking, for example - but they are proud to succeed the challenge of developing unique processes or textures.

Most of these textiles originate as new extensions of polyester that offers unlimited possibilities. Considered as an inferior fiber for clothing and furnishings, its status was elevated by means of constant reinvention and future vision. These fabrics have been enlivened by the prosaic textures on its surface, an approach often used to hide defects in lesser degrees on plastics and glass.

Heating, steaming, needling, acid corrosion, polishing, trimming, shaving – aggressive treatments associated with durable materials like stone, ceramic or glass – turns polyester into a fabric that challenges our vision of what textiles can be. Sorted folds, wrinkled pleats and textures are indelibly molded in these synthetic fabrics, which thermoplastic properties have heat memory. Their favorite features are the diverse textures of Japanese culture, for its asymmetry and elegant imperfection, found in most of its art forms.

Many designers based in Tokyo have excelled in the transformation of mundane materials in such an astonishing polyester surface with great finesse. They experiment with various fibers and finishing processes to explore the physical characteristics of the material, often giving new interpretations to old techniques. Like their counterparts in rural areas, they also seek inspiration from their surroundings, but their environment is the urban landscape. The textiles reflect the character of its frenzy, brightness, motion, rush of city life, full of energy (Figure 1).

The relocation and accommodation of new technology to traditional creative methods impose a challenge to contemporary life. Most cultures of the world have been confronted with a fusion of ancient techniques and industry of the twentieth century. The textiles have not been exempt from this phenomenon; as they are inseparably linked to the activities and everyday language, provide a reflex of this through the integration of old and new. In Japan, a particularly rich textile tradition has turned into one of the most innovative industries in the field. The factories with five or more generations that became expertise holder in some aspect of the production of kimonos, now develop materials and technologies that contribute significantly to the contemporary textile culture. Ancient techniques have not been replaced, but adapted and expanded.

According to McCarty and McQuaid (2011) any material that has the property of being molded or extruded in a particular way can be sculpted - as stones, metal and clay. When textile surfaces are sculpted and highly articulated, landscapes are formed by manipulation and the behavior of the yarns is revealed. Heat plays an instrument and sculpts many fabrics through heating. They are often printed with, or adhered to a substance that reacts to heat to determine the outcome of the texture.

There are three types of pleats:

- Manual pleating: craftsmanship class by handmade process aided by iron pressing;
- Machine pleating: folds are made parallel by the passage of a roll of fabric between heated rollers, creating pleats;
- Pleating by patterned molds: in this semi-industrial process, the precut fabric is placed between two sheets of paper folded into patterns, which is heated to form the pleats.

Inoue Pleats was the first company to produce pleats on a large scale in Japan. The companies and designers like IsseyMiyake, have popularized the pleats in the contemporary fashion world.

The focus in this research remains in manual and handmade pleating.

The Art of Fabric Manipulation: Manual Pleating

According to Wolff (1996) fabric manipulations change the look and the feel of a piece of cloth through the use of threaded needle. They texturize, embellish, inflate, and support. With stitching by hand or machine, they resurface, reshape, restructure, and reconstruct a flat, supple peace of cloth into entirely different disposition. These techniques have been materialized during the long history of fabric. Through the way, people who have handled cloth, performed modifications, alterations and variations for those elemental techniques. Identified by pleating, gathering, tucking, smocking, quilting, these terms are part of our current vocabulary. These techniques have history and longevity, and they are valid nowadays as much as they used to be. Wolff classifies pleat types, as flat, knife, inverted, partial, projected, accordion, wrinkled, double-controlled pleats and includes their derivations.

The pleating processes described are mostly done by hand, rarely using a home pleater. The design is the means of planning the arrangement, calculating the necessary fabricfor the target dimension, fitting by detailing the pleat measurement. The fabric is hold with pins and basting. Pressing or the use of iron becomes essential because sometimes heat, steam and pressure are as much part of preparation as needle and thread. At other times, steaming finishes the job, preserving the arrangement of folds very carefully.

Although up to this point the pleating designs are geometric, Wolff classifies another group as*wrinkled pleating*. The irregular ridges and grooves are set by scrunching damp fabric securing it tightly, and letting it dry. There are two types of wrinkled pleating.

In the *broomstick pleating* a damp fabric is gathered up, rolled around a cylinder, and bound to hold until dry. In the *contortion pleating*, a damp fabric is twisted into a rope, coiled, knotted, and carefully dried in a microwave oven. When opened out, the wrinkled folds are multi directional. Niepceron (2014), French consultant for many Brazilian fashion brands, uses a variation for the technique: dry fabric is press steamed after contortion.

Shibori Wrinkled Pleating

The contortion pleating and *Shibori* has much in common. Wada (2002) describes *Shibori*as a Japanese word that refers to a variety of ways of embellishing textiles by shaping cloth and securing it before dyeing. The word comes from the root verb *shiboru* that means to wring, squeeze, press. It is used to designate a particular process to resist-dyed textiles, as the root verb emphasizes the action performed – the process of fabric manipulation. On the two-dimensional surface, *shibori* techniques give three-dimensional form by folding, crumpling, stitching, plaiting, or plucking and twisting. The textiles shaped by these methods are secured in a number of ways, such as binding and knotting (Figure 2).

Lognon Pleat's by Patterned Molds

Working with textiles is a family business, for Gérard Lognon, French pleater. His grad grandmother, Emilie used to do the laundry for Empress Eugenie.

He keeps his unique memories from his childhood. He loves going into a pleating house. It always remains a particular cardboard odor that permeates all the walls. When he was a student and used to go up the floors to enter the house of his parents, and they warmed the steam oven, he knew by the smell of steam and damp cardboard that he had not in a mistaken house. The passion in his job has made him meet fashion designers who make him take part and tuned with their collections. Through four times a year for haute couture and ready-to-wear, he looks for new pleats to study in order to prepare the season pieces to come (Trebbi, 2008, p. 68-72). Most of the 3000 molds or fancy cardboard patterns used by Lognon were made by his grand grandfather. These are handled very carefully and used once a day, according to the head of the studio Liliana Leboul, doing the pleating "with love" for thirty-seven years.

Lognon, is considered one of the greatest Parisian pleaters, according to Vasseur (2002). He has pleated Hermés scarves since the seventies at the rate of two hundred to three hundred pieces a day. It is exactly a hundred and one folds on each silk scarf. It is a delicate work. After being worked by a machine between two cardboard templates, the scarves are embedded, fold-by-fold, between the molds, collapsed in long narrow sets, and then wrapped around large cylinders to be placed in the steam oven in order to permanently fix the ruffles. Silk is a tough fabric pleating and requires additional operations. The result is the volume and flexibility. The scarves are easy to tie or fix and ruffles exalt their colors and light games.

Technical process data used by Lognon, according to Trebbi (2008):

- The fabric is always worked toward the selvedge; the pleats are made perpendicular to the fabric length.
- The molds have an average length of 1.50 m to 3.50 m at most and height of 1.40m.
- The assembly is wrapped around a metal cylinder that is protected by a craft paper, then inserted into the vertical heater. It is a delicate equipment, gas fired and may contain an average of twelve rolls.
- For pleating or silk tulle or muslin, the rolls remain in the steam heating oven at 80°C for 50 min; for wool, 95°C for 50 min; for polyester at 105°C for 50 min.
- The roll assembly must cool for at least 24 hours. The mold is then removed.

Tessellations as Complex Pleats

Extrapolating to complex pleats, tessellation is defined by Rutzky and Palmer (2011) as special kind of motif composed by shapes placed together without gaps. Well-known ancient examples include many patterns used as ornaments on walls, floors and ceilings. "

Module is the unit of pattern, the smallest area including all visual elements of a design, according to Rüthschilling (2008). Square blocks sewn together like patchwork blocks, also form a tessellation. Ceramic tiles, in particular, are made of an impressive variety of shapes fitted together to make a composition. Despite tessellations may have curved edges, the patterns designed with folded pleats are made of shapes with straight lines. These polygons are set together to fill a certain area.

Many art forms and tessellation modules are used to decoration and ornament, often expressing a specific style of a particular geographic region or culture. Examples are the rings in repeated motifs in Asian pottery, ceramic blocks forming large mosaics in Middle Eastern cultures and the union of fabric blocks in American quilts. More specific examples, in architecture, are in the palaces and mosques in the Middle East and southern Spain, like in the region of Andalucia, in the city of Granada and the Alhambra palace.

The *shadowfolds* are the tessellations made by Rutzky and Palmer, as shown in (Figure 3). The translucency of the textile is the property that makes these pleats different from the other ones. In the process, first they produced separated blocks then saw to each other, as in the quilt. Then they started doingon a single sheet of fabric. The mentor of this idea is the *father* of pleated tessellation, Shuzo Fujimoto. His work looks classically Nipponese, with the use of modules in hexagons, squares and triangles. In their works the pleats are formed by hand stitching and making knots to unite the intersection points.

The thermic molding process, according Rutzky and Palmer (2011), are the most highly developed examples of pleated fabrics were made in the last century, by French artisans. In this method the tessellations made in pairs of pleated cardboard on either side of the fabric. When the cardboard molds fit, the fabric is forced to take on the folds of the outside layers. This assembly is then heated to set the subject tissue. The mold is removed and broken down and retains the ground pleated fabric which can be used in a variety of applications.

Conclusions

Under the aspect of design-oriented clothing, the pleats in its simplest configurations, as described by Christian Dior, add value in several aspects. Functionally, give ease and comfort. Aesthetically, they keep the elongated feminine silhouette and lines, and also provide body movement. Culturally, for its users, the pleats are associated with traditional features, out of the trend, which might be opposite to the youth image as enshrined in fashion. The pleat features, keeping, however, the traditional technique are trademarks for companies held by experts such as Gérard Lognon in the service of French haute couture. In this fashion category, the values associated with the ethical aspect of the product, by aesthetics of undeniable beauty and intrinsic high level of manual work, the cultural aspect of the legacy of a history since Worth, is kept alive with an aura of idealism and the controversial uniqueness in contemporary thought. Other possible values and associated emotions are recognized as assets, so keeping them, have extensive dimensions of meaning.

The future may be the further spread of the enigmatic and hypnotic effect of tessellations and its complex geometric configurations. Or, in contrast to this possibility, there is purity in the new reading of other Eastern traditions. Both worship the past, but can be used or even more, make use of materials and technologies available to disseminate a timeless beauty, which is worth daring to say, eternal.

Figure 1: Accordion Wrinkle. Inoue Pleats Co., Ltd.

Source: McCarty, C.;McQuaid, M., (2000).

Figure 2: Issey Miyake. Partially Crushed and Tied Shibori. Autumn/Winter 1993/94.

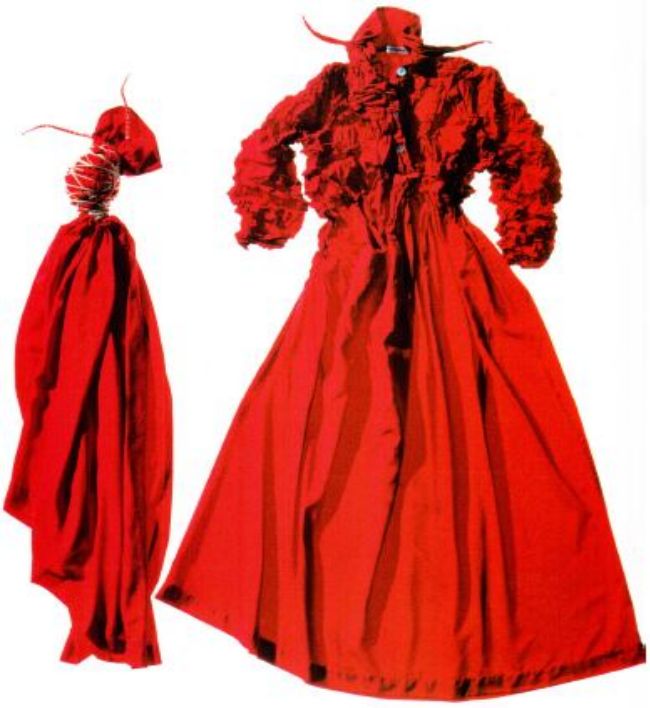

Photo: Tetsuo Yuasa. Source: Wada, I., (2002).

Figure 3: Zillij Twelvefold Tessellation, silk, 1997. Front-lit (left) and Backlit (right)

Source: Rutsky, J.; Palmer, C., (2011)

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