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TO SEW OR NOT TO SEW. SEAMLESS CLOTHES AND SEAMLESS APPEARANCE IN FASHION DESIGN

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Abstract: *At first glance clothes are obviously made by cutting and sewing. The textile fabric is cut in different shapes and reassembled by sewing in the wanted shape and volume. Sometimes the structures can be quite complex. The truth is that there are more ways of making clothes, as we can see looking back into the history of fashion. The progress of technology in textile industry offers also very interesting directions that we could not dream about some time ago. Observing carefully the economy of seams, their presence, absence or the suitable number can move us towards creative solutions that are relevant not only for the esthetic of a garment but also for the process of making clothes suggesting alternatives for the present situation and its important problems like sustainability.*
This paper is a survey of alternative ways in making clothes and highlights the relation between concept and practical issues. The starting point is seamless clothing and the natural fascination of the subject. Going further on this line we should consider that the absence of the seams in a garment is not the same with a seamless appearance.
So, do we really need to sew our clothes?

Key words: *seamless, sustainable fashion design, textile techniques, rapid manufactured textiles, transformable clothes, design for disassemble*

1. INTRODUCTION

A Chinese idiom states that “Clothes from heaven are without seam”. This is obvious a way of suggesting perfection, the flaw-less handling of anything. Anyone can understand its meaning, the idea is traveling through time and cultures as it has deep roots in the human mind: “It is well known that smoothness is always an attribute of perfection because its opposite reveals a technical and typically human operation of assembling: Christ's robe was seamless, just as the airships of science-fiction are made of unbroken metal” [1] sais Roland Barthes in the XX- century. But what happens when it is taken literally? Is “seamless” a way to perfection in clothing too?

On the one hand, the desire to make the fabric follow the shape of the body varies across times and cultures. From the draped garments of the antique world to the rigid corsets in the 16 the century the story of the changing ideal human beauty and the practical needs developed a great variety of solutions in getting dressed and some of them need no sewing. On the other hand there are more ways to make structured garments without cutting and sewing than we could think.

2. UNSTRUCTURED CLOTHES. NO CUT, NO SEW. HOW TO CUT, HOW TO SEW

The unstructured garments of the Antiquity can be easy to build as they are wrapped, pinned or tied in place. In Europe the structured garment developed from the end of the Middle Ages on. Its increasing complexity in the construction, requesting a lot of cutting and sewing made the tailor s job and can be traced in the prestige of the fashion designer of our time.

To consider complex clothing simply better than unstructured clothing is just a way of thinking. Comparing different cultures can highlight different ways of seeing things. In oriental cultures a taste for unstructured and transformable clothing can be observed, considering the pareo, sari and kimono and other forms in which a piece of cloth becomes a garment in no time. The cult for wrapping and binding in China and Japan flowed into an art form in traditional culture tracing a different way to perfection. It is interesting that this way of dressing includes the wearer's skill, as in kimono wearing or furoshiki wrapping for example.This skill is trained and reflects the care and attention the wearer puts in the garment or object wrapping. Furoshiki, the Japanese traditional wrapping cloth, actually a square of cloth, is delightfull and multifunctional: a shoulder bag, tote bag, belt bag, or even a hat cap by folding. It is obviously creatively eco-friendly as it was promoted by the Japanese Minister of the Environment in 2006 or by Vivienne Westwood in 2013.

The western structured clothes live less space for intervention. In fact we can observe that to stitch means also to fix, to fix the unstable shape of the textile fabric in a certain configuration. This difference of thinking a garment reflects in fact in very practical issues and we can bring another example: the initial difficulties of selling the Singer sewing machine in Japan as the traditional clothing used loose chain stitches that were easy removed so that the clothing could be taken apart and the assorted pieces laundered separately. [2] The idea of loose versus fix easy can takes us also to the idea of transformable clothing and we could go further seeing the advantages in the implication of the user.

All the topics exposed here (multifunctional and transformable items, loose versus fix, implication of the wearer) are surprisingly current and could be resumed like this: “garment designs that extend the wear life of a garment through versatility, adaptability and meaningfulness.” as it is shown in a 2011 study [3] that reflects upon how, in the context of increasing interest in environmental impact, designers can promote sustainable fashion opportunities by creative design solutions.

The literature reflecting preoccupation for sustainable fashion is quite recent, in an 2013 study a timeline is attempted [4], a line that starts in 1998 with the book *Ecotextiles. Sustainable Development: Proceedings of the Conference Ecotextile ‘98*, of A.R. Horrocks as editor and we could highlight authors like Kate Fletcher, Sandy Black, Alison Gwilt and Timo Rissanen and we could ad Kirisi Niinimaki.

In achieving sustainability in fashion a few themes can be traced through these works and they can be resumed in fact by the principles of environmental design as they been established by the European Commission: use low-impact materials whenever it is possible, focus on resource efficiency, invest in high quality and durability: longer lasting and better functioning products which age aesthetically, reuse, recycle and renew[5] or more specific [6]: reuse waste materials, recycle/up cycle, repair and remodel garments, recreate (e.g. existing design concepts), reduce (use of resources and creation of waste), use ecological materials, use mono, materials, use new technologies, create longer lasting products, design multifunctional clothes, design for delight. The research performed on these themes is very interesting and in more than one case suggests that old solutions can be reconsidered. I would stop upon **multifunctional, transformable clothes, design for disassemble and the Zero Waste concept.**

The closer you stay to the fabric the more possibilities remain open. A sari can be worn in a lot of ways. In this direction could be mentioned also Ximena Valero's OMG garment from 2000, or Magic Wrap Skirts. These garments do not need high technology, but can be changed into various style and types, elasticity of fabric helps in adjusting it to the body. Wearing such a garment chalenges the users creativity favourising a diffrent relation to the object that is much deeper than can be achieved through typical fashion solutions. All this relates naturally with the idea of slow consumption. Different directions can be shown in making transformable clothes: reversible and folded/tying designs; modular designs; smart clothing; and do-it-yourself (DIY) and multi-lives designs. [7]

The first category is closer to our subject and we can quote here: "The Five Ways” research project developed by Kate Fletcher in 2002-2003, or “The Life of a Piece of Cloth” as done by Chen, C., & Lewis in 2006 [8], a project in which they demonstrate multiple lives of a garment: first a form of wrap, then cut and sewn and finally set for recycling or disposal.

The preoccupation for the after life and disposal of a product can lead us to think further. It is easy to recycle garments made form one material but this is not a common case. Another possibility is designing for easy disassemble, but this is more complicated in clothing. A very interesting solution goes on the direction showed by the reversible stitch used in Japanese traditional clothing that we

mentioned earlyer. „wear2™ developed a new seam technology that enabels garments to “fall apart” instantly as seams are made with a material that melts in microwave treatement. [9]

As we can imagine, the idea of zero-waste fashion is not new, it was just given a new name and developed some literature and projects around. In our grandmother's life, garments were made with a sense of economy, as in traditional clothing everywhere. The research performed on this subject showed there are several directions that can be developed. Basically, these methods rely on wrapping and tying or on creative pattern cutting. In the last case the idea is to consider not only the shapes used in constructing the garment but also the remaining ones in order to use the whole piece of fabric using a jigsaw like strategy. Using simple geometric shapes is obviously the easier solution. [10]

Design researchers preoccupied by the subject include Timo Rissanen and Holly McQuillan [11] who initiated *The Cutting Circle*, a global collective of creative pattern cutters. Julian Roberts is one of them and he is promoting a very interesting approach: “Substraction cutting”: The resulting shape is created by the removal of the fabric, rather than the addition of fabric. This removal creates empty space for the body to occupy but also effects how the fabric drapes around the body. [12] David Telfer is another designer preoccupied by the concept of zero waist design and DYO methods. He worked since 2008 upon a technique (Minimal Seam Construction) that relies on reducing the number of seams used to construct a garment and by this the manufacturing process is also shortened. [13]

3. SEAMLESS APPEARANCE IN CLOTHING.

Still, as we already stated, the absence of the seams is not the same with a seamless appearance in fashion. The shapes obtained by draping and wrapping are limited, it gets more complicated when we want to get closer to the shape of the body or the shape we want to achieve is not material driven.

To make a perfect gown, one that looks like it directly sprung out of its creator's mind or grown out like a flower from a seed reflecting the wisdom of nature, was as a matter of fact a temptation for many designers even if the history of fashion shows that the success does not depend on the number, presence or absence of the seams or on their visibility.

For Fall 2014 Couture Lagerfeld played with the idea to create "sans couture" demonstrating how the flawless appearance can be achieved by virtuosity. And history of fashion is full of dissimulating tricks. Knowing all of them one can get really close to the ideal image. The construction lines can be reduced in number by using the bias for example or can be placed strategically. And then, embroidery techniques, thinking that embroidery means working on the surface of the fabric, can do a lot in hiding the seams or on the contrary integrating them in the final image as graphic elements: “Those seams were often turned into points of emphasis, breaking into rivulets of fullness in back of sequin spackled day suits, or delineated by bands of golden braid on sculpted neoprene dresses. Others were beaded with microscopic cubes of concrete, smothered in ostrich feathers, or blanketed with billions of paillettes”[14] or: “The method he used requires four hours of handwork to cover a length of two inches, but the effect of flat, random stitches on pastel wool bouclé dresses and jackets was successful enough to make the seams appear magically erased.” [15]

The growing interest in seamless appearance and seamless clothes can be related to the technological development. “The success and excitement generated by the moon landing in 1969 inspired an enthusiasm for all things futuristic including the aesthetics of fashion and the performance of textiles.(...). Several contemporary designers have exaggerated seamless attributes, resulting in an overall aesthetic with a futuristic „otherworldly” quality.” [16] Such designers would be for example Cristobal Balenciaga (1967 silk gazer) who is known for the minimalistic, smooth constructions. Paco Rabane's 1966 *12 Unwerable Dresses in Contemporary Materials* collection shows a clear disregard for conventional seams along with the use of unconventional materials. His approach reveals alternative solutions in fastening the material in a desired shape.

The space suit, the completely sealed garment is first of all a technical performance. This is another reason for seamless appearance's gaining in popularity, especially in the development of performance apparel and along with new textile materials. Sportswear can substantially improve performance as the controversies on the subject shows. And of course if we talk about the real performance we should also consider the success of appearance that suggests performance that extended in clothing with other destination.

4. NO CUT NO SEW. ALTERNATIVES.

The truth is that the progress in textile offers more real possibilities in making seamless clothing that have, beyond the aesthetic aspect and performance, the advantage of economy in material and manufacturing time. Starting from the basic textile techniques, some traditional, some unconventional: braiding, basket weave, crochet, felt, knit, knot, lace/embroidery, mould, nonwoven, spun bound, paper/origami, plastic/rubber, latex, PVA(use of an intermediate medium), wrap, spray, thermo set, weave, material (formation of materials, material science, etc) we can find very interesting results. [17]

Braiding, basket weave, crochet, knit, knot and lately weave are techniques that basically allow the control of the evolution of each yarn in the structure and by this can be used in seamless complex structures. The development of digitally controlled looms led to amazing results as those performed by Japanese designer Issey Miyake.

Known for his innovation in fashion, Issey Miyake brought in 1999 to the catwalk a single banner of fabric embedded with 23 dresses connected. This was an unusual event but it illustrates the designers' interest in alternative ways of making clothes (and things). It is about an experiment he began in the mid - 90's and have turned into an independent line in 1999: A-POC (A Piece of Cloth). The process " breaks one of the fundamental laws of fashion physics: cut and sew. (...) Thread goes into the loom, the dress comes out. Specifically, a flattened tube of material emerges that contains the finished shirt, skirt, or pants, which need only to be cut out along the faint outline already woven or knit into the fabric. Moreover, the material can be snipped anywhere without unraveling, a feature that allows for complete customization. [18] Not merely technology innovation, this goes back to traditional Japanese clothing, the maximal use of the fabric and again the implication of the wearer. The minimal appearance of the 23 dresses from 1999, if not intended, can be improved; experiments with the thickness of the thread, the density of the weave, the shape of the garment, elasticity were already.

Other techniques can offer amazing results in seamless clothing. Working with fibers, in felting, the shape can be given directly like modeling in clay as we can see in the felted cashmere products promoted by the Chinese brand Shang Xia [19]. They go as far as even the buttons are made of the same material.

Starting with the fiber we can also mention the spray method. This is an older idea that can be traced back in 1981, [24] but was developed later by Manel Torres. The method „involves the creation of a liquid suspension which is then sprayed by use of either a spray gun or an aerosol can. The fabric is formed by the cross-linking of fibers which adhere to create an instant non-woven. [20]

Molding and modeling the fabric takes new perspectives in fashion design with the new synthetic materials which can be thermo set for example. Still, unexpected solutions popped up considering unconventional materials. We can quote here the experiments of Gary Cass and Donna Franklin through *SymbioticA*. [21] In 2007 they conceived a system for cultivating the *Acetobacter* in wine and obtained sheets of fermented fabric. The idea of bacteria producing fabric was also approached by Suzanne Lee. She is able to 'grow' a material that can also be molded in seamless structures. [22]

Growing dresses is an interesting concept in relation with seamless idea regarding the flawless quality not only of the shape but also of the process. The idea that we could find a direct way to the final object is of course appealing. A way of doing this would be rapid manufacture.

It seems that RM textiles were invented by Jiri Evenhuis back in 1999. The structures that he and his partner developed are realized using a usual layered prototyping method and actually are quite far from the filamentous common textile structures. Exactly the constructive characteristics of the structure opens possibilities of assembling different from the usual cutting-sewing method and so it offers possibilities in seamless clothing like in Paco Rabane's unconventional material dresses. "It talks about technology and convergence, and more importantly the idea that we are moving from an era of assembling 3D structures from 2D components, and into direct 3D manufacturing." [23]

Designers like Iris van Herpen were interested in working with this technology (2010- *Crystallization* at Amsterdam Fashion). The delicate construction illustrates the technique being explored in Haute Couture; still the clothes are rigid, quite far from the fluidity of the textile fabric. One problem of this method is "about finding the new aesthetic formal language of this new manufacturing paradigm. It's not just about replicating a form from the computer, though that is part of it—it's about cultivating new material behaviors." as designer Francis Bitonti shows [24] The way

to real dresses passes by designer Michael Schmidt who in 2013 created the already well known Dita von Tesse seamless dress: The First Fully-Articulated 3D Printed Gown. It is custom fit and essay to classify as "Haute Couture". For a RM piece it included a lot of manufacturing both in assembling and in decoration. Further, the designers from *Nervous System* show that all these problems can be solved. Their dresses' lace like structure moves like a real fabric and, more remarkable, is printed in one piece. More, they developed a web application where people can design custom-fit 3D.

5. CONCLUSIONS

Imaginary and reality are always intertwined. The ideals, imaginary things are not as far from us as it seems. Influencing the way we think, they always find their way into objects.

The idea of what a textile product can be, how it looks like and how it is made can be changed and it is changing as we speak. A lot of our problems can be solved only by going back to interrogate: how we do things around and why? Usual ways of doing things is not always better and revisiting traditions can lead to new solutions.

The new materials and methods have the power to challenge not only the design and manufacture of textile industry and fashion but the whole system of production, distribution and consumption.

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