



TRANSFORMABLE CLOTHING TO REDUCE PRE AND POST CONSUMER TEXTILE WASTE

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ABSTRACT: Using transformable clothing designing methods a single textile item can be worn as multiply styles. Transformable clothing can extend the life cycle of garments and reduce amounts of pre and post consumer textile waste. Two brands by Sandra Garratt present are a good sample of industrially manufactured transformable garments. Their great commercial success in 1980's was based on the use of stretchy knitted fabrics and simple, loose shapes of her garments. In the experimental part of the research a set of textile goods for industrial manufacturing were created to promote currently very actual sustainable fashion concept. Its versatility and constructive solutions could ensure effective fabric use, simple manufacturing process, as well as, attractive outfits for their consumers.

Key words: transformable clothing, sustainable fashion, pre consumer textile waste, post consumer textile waste.

TRASFORMABILNA ODEĆA ZA SMANJENJE TEKSTILNOG ODPADA

APSTRAKT: Korišćenjem transformabilnih metoda dizajniranja odeće jedan tekstilni predmet može da se nosi kao više stilova. Transformabilna odeća može produžiti životni ciklus odevnih predmeta i smanjiti količine tekstilnog otpada pre i posle potrošnje. Dva prisutna brenda Sandre Garratt predstavljaju dobar primer industrijski proizvedene transformabilne odeće. Njihov veliki komercijalni uspeh 1980-ih bio je zasnovan na upotrebi rastegljivih pletenih tkanina i jednostavnih, labavih oblika njenih odevnih predmeta. U eksperimentalnom delu istraživanja kreiran je set tekstilnih proizvoda za industrijsku proizvodnju kako bi se promovisao trenutno veoma aktuelni koncept održive



mode. Njegova svestranost i konstruktivna rešenja mogu da obezbede efikasnu upotrebu tkanina, jednostavan proizvodni proces, kao i atraktivnu odeću za svoje potrošače.

Ključne reči: transformabilna odeća, održiva moda, pre potrošača dobijeni tekstilni otpad, posle potrošača dobijeni tekstilni otpad.

1. INTRODUCTION

Transformable clothing is a concept offers to fashion designers creating garments with changeable shapes or functions, designing multiply styles from a single item [1]. It can be obtained using specific constructive solutions, modular designs or advanced textile materials [2]. Next to versatility, such textile goods support currently very actual sustainability strategy in textile industry [3,4]. Transformable clothing extends the life cycle of garments and with it reduce amounts of post-consumer textile waste accumulated as a result of up normal shopping supporting fast fashion business model [5,6].

Many designers, such as, Marfa Stance, Petti Pli, Issey Miyake work with transformable design methods creating their unique garment styles or whole collections [1]. However, the greatest samples of industrially manufactured transformable clothing are garments of American designer Sandra Garratt [7].

2. TRANSFORMABLE CLOTHING BY SANDRA GARRATT

In 1980's two brands of clothing by Sandra Garratt "Unites" and "Multiples" were sold in USA with big commercial success. The styles of the brands were called modular, however, the most part of them belong to group of *transformable garments* - the garments with easy changeable shapes to obtain different design variations and different outfits. The collections were created from up to 50 simply shaped garments: tops, dresses, tunics, wraps, skirts, pants, leggings, shorts, and different size tubes (see Fig.1).

The tubular items included in the collections could be transformed and used as a skirt or a dress, a hood or a scarf or a belt. Some styles were modular - had detachable sleeves or other parts. The styles could be worn in different transformable ways alone or combined with other items. All garments were manufactured from cotton-polyester jersey fabric in few colours - black, red, white, gray, olive, navy.



Figure 1: Transformable clothing by Sandra Garratt

The ready goods were sold packed in plastic bags with guidelines “Multiples Memo” (see Fig.2). The guidelines showed to a consumer how to wear obtained parts and which other items of the collection are advisable to purchase to create new individual outfits [7,9,10]. The collections, transformation and combination ideas of garments were also promoted in press and specially organized fashion shows.



Figure 2: Wearing guidelines “Multiples Memo”

The affordable price level and possibility to create numerous outfits from few items of the collection made the *transformable* clothing very popular to huge number of American women [7,8,10]. As the result, brand shops were opened also in Europe, Australia and Japan. At the end of 1986 more than 47,000 pieces of the collection were sold a day and the *transformable clothing* line "Multiples" became one of the most successful brands in USA [7]. The success of *transformable* garments by Sara Garratt gave idea to many another



American companies to start business with similar goods. However, during 1990's weekend by growing competition and attracted by new fashion ideas, clothing manufacturers left *transformable garment business* [7].

Analyzing the above described *transformable* garment collections by Sandra Garratt it can be seen that their commercial success were based on several important qualities (see Table 1):

1. *Knitted stretchy fabrics* - elasticity of the material ensured possibility to create easy transformable, simply shaped and maximally comfortable clothing, clothing which manufactured in a single size could be worn by purchasers of more than one size group.
2. *Simple shapes* - simple geometrical shapes of the garments ensured efficient fabric use, simple manufacturing process, easy packing of ready goods and, as the result of all mentioned, affordable price level for consumers. Geometrical shapes of garments also gave possibility to create unisex clothing acceptable for both genders - women and men.
3. *Tubular items* - tubular items were specific part of the collections that by themselves cannot be even called garments. However, created from stretchy fabrics they were easy transformed on a human body in different kind of garments - dresses, skirts, hoods, scarves or belts. They ensured high diversity and good fit to wide range of different size group consumers.
4. *Cotton-polyester blend* - polyester added to the natural origin material ensured additional comfort - wrinkle and ironing free, easy care garments.

Table 1: The most important qualities of transformable clothing collections by Sandra Garratt

	Qualities	Benefits
1.	Stretchy fabrics	comfortable garments, single size, easy transformation, simple shapes
2.	Single size	loose garments, comfortable garments, simple shapes, stretchy fabrics, simple manufacturing, low price, unisex
3.	Simple shapes	comfortable garments, single size, modularity, efficient fabric use, simple manufacturing, easy packing, low price, unisex
4.	Tubular items	comfortable garments, easy transformation, stretchy fabrics, efficient fabric use, simple manufacturing, low price
5.	Modularity	simple shapes, stretchy fabrics, tubular items, plain fabrics
6.	Cotton-polyester blend	comfortable garments, ironing free, easy care
7.	Plain fabrics	easy coordination, current trend
8.	Fabrics with geometric pattern	current trend
9.	Simple manufacturing	Single size, simple shapes, easy packing, low price
10.	Easy packing	ironing free, single size, simple shapes
11.	Low price	simple shapes, stretchy fabrics, efficient fabric use, simple manufacturing, easy packing

However, the critical and most important quality of transformabile clothing of two described brands was the material used - *stretchy knitted fabric*. By help of such material the most important benefits of the collections were obtained:

- transformability of styles,
- possibility to sell garments in single size,
- simple manufacturing process,
- low prices for consumers.

All these four benefits made the collections maximally attractive for wide range of consumers. Transformability of collections were obtained from two kind of garment styles: simply shaped loose styles and close fitting tubular items.

3. EXPERIMENT

A set of textile goods which could be industrially manufactured and sold to promote sustainable fashion concept were created using above researched qualities of *transformable* garment collections by Sandra Garratt (see Fig. 2,3). The textile goods were designed from stretchy 100% cotton plain fabrics in three basic colours - white, black, red.



Figure 3: Transformable dress A with a hood (a) and draped dress B (b)
Photos by A. Blanuša



Figure 4: Transformable skirt C (a,b) with a red belt (a,b) and a scarf/top (b)
Photos by A. Blanuša

The set of transformable goods consists of: a black dress/skirt, a red belt/top and white scarf/top. The simply shaped dress has three constructive elements:

- a tubular upper part - used as a hood of the dress A (see Fig.3a), draperies on one shoulder of the dress B (see Fig.3b) and a top part of the skirt C (see Fig.2a,b).
- a tubular bottom part - use as a bottom part of the dress A and B (see Fig.1) and a bottom part of a skirt C (see Fig.2).
- two tubular elements in between upper and bottom parts - used as sleeves of the dress A (see Fig.1a) and conditional pockets of the skirt C (see Fig.2a,b)

The red wide belt can be used as a top or belt with the skirt C (see Fig. 2a,b). White scarf can be added separately or creating the top for the skirt c (see Fig.2b).

The dress/skirt and other two parts of the transformable set could be manufactured in a single size to be used by consumers of S and M size groups. Geometrical shapes of all components ensure effective material use, as well as, simple manufacturing process (see Fig.5). Only two kind of industrial sewing machines are needed to join all components of the set - overlock machines of stitch type 514 and interlock sewing machines of stitch type 406. The set can be simply folded and sold in a packed way adding instructions how to create all designed combinations from three parts of the set. In future new design elements for the dress /skirt could be designed and offered to the purchasers.

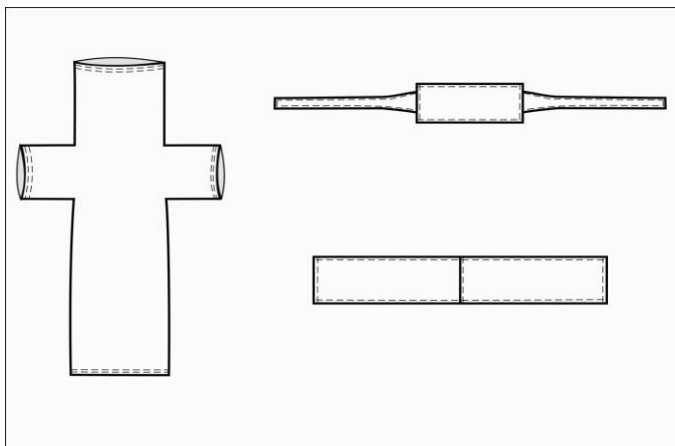


Figure 5: Transformable dress A, with a red belt and a skarf/top

4. CONCLUSIONS

In the article transformable clothing concept and the most important qualities of transformable garments were described on the bases on already commercially successfully sold clothing collections of similar concept. As well as, a set of transformable textile goods for industrial manufacturing needs were designed. On the bases of all theoretical and practical research following conclusions were made:

- Transformable clothing can extend the life cycle of textile goods and with it reduce post-consumer textile waste. Such kind of garments have to be actively promoted and manufactured industrially.
- Analyzing industrially manufactured collections of transformable clothing by Sandra Garratt, it was found that their commercial success was based on following important qualities: the use of stretchy fabric in basic few colours and simple and loose shapes of garments.
- Stretchy fabrics, simply shaped and loose garments can ensured transformability to styles, possibility to sell garments in single size, simple manufacturing process, as well as, affordable price level to different age and gender consumers.
- Respecting the most important qualities of transformable clothing, a set of textile goods were designed for industrial manufacturing needs. The set is created from three parts: a dress/skirt, a belt/top, a scarf/top. Four different outfits can be designed from the set of transformable textile goods.
- Transformability concept of designed goods could help to extend their use period, and with it, reduce post-consumer textile wastes. Geometrical shapes of goods and their manufacturing in a single size could ensure efficient fabric use, and with it, reduce pre-consumer textile waste.



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