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UPCYCLED DENIM FASHION DESIGN THROUGH STRUCTURAL TRANSFORMATION

Purpose. *Development new clothing models based on the principles of structural transformation of physically and morally worn-out items. Jeans were chosen as the prototype, as they are among the most long-lasting and widespread garments due to the durability of the material and their stylistic versatility. From their origins as workwear, they have become an essential element of contemporary fashion, found in virtually everyone's wardrobe. However, the high consumption of jeans generates significant amounts of textile waste, making the structural analysis of these items an important starting point for their redesign and transformation into new products, in line with the principles of sustainable fashion. Therefore, recycling denim products is a key factor in the fashion industry's environmental agenda.*

Keywords: *circular fashion, upcycled denim, woman's clothes design, sustainable fashion,*

Objectives. This paper aims to investigate and demonstrate how recycled denim can be effectively used in the creation of women's clothing, by applying the three principles of sustainable fashion. The emphasis is placed on redesign as a means of reimagining already existing materials, on the creative reuse of textile resources derived from worn or unused products, as well as on the recycling of denim fabrics for obtaining new, aesthetic, and functional garments. The paper seeks to demonstrate that the creative reuse of textiles not only reduces the negative environmental impact but also opens new aesthetic and conceptual directions in contemporary design. The objectives of this research are:

1. To analyze the context of the problem by highlighting the necessity of applying circular economy principles in the fashion industry, as a solution to current ecological and social challenges.
2. To investigate the "3R" concept Redesign, Reuse, Recycle and its role in underpinning sustainable design strategies, with a focus on its applicability in the garment creation process.
3. To conduct a structural analysis of denim pants from the perspective of constructive transformation, with the aim of identifying possibilities for redesigning and revalorizing recycled material into new products.

4. To select and document suitable clothing products for the development of recycled design, in accordance with sustainability principles and contemporary aesthetic requirements.

5. To develop and present models of garments created on the basis of sustainable fashion principles, with transformation as their foundation.

Methodology. The structural analyses of denim pants in the contexts of reuse their parts for designing new products [1]. Jeans could be divided into several components: main panels (front and back), waistband (the upper part of the pants), front and back pockets, side and inner seams, hems, as well as fastening and reinforcement elements (zippers, buttons, rivets, snaps). Each of these parts has a well-defined functional role but can also be individually utilized in the redesign process. The main panels, due to their large surface area, are the most valuable in redesign. They can be cut and reassembled to create skirts, dresses, vests, or even jacket pieces. This modularity offers numerous possibilities for transformation, whether the goal is to create new garments, accessories, or decorative items [2, 3].

The design project was developed in the software Gemini CAD.

Research results. The result of research is conceptualization the woman's clothes through structural transformation of used denim pants, constructive and technologic design of it and prototyping. The three fundamental directions of sustainability in fashion, known as the "3R" redesign, reuse, and recycle provide effective solutions for reducing the negative impact of the industry on the environment and for promoting responsible behavior among designers, producers, and consumers. These principles also align with global sustainable development goals and with the growing market demand for ecological, ethical, and value-added products [4, 5].

Selecting appropriate garments for the development of recycled design is a fundamental stage in the process of creating sustainable clothing items. The choice of women's products made from recycled denim, particularly sourced from worn jeans, is not accidental, due to its thickness, texture, and durability, denim offers multiple opportunities for redesign. Old denim pants could be transformed into skirts, dresses, vests, short jackets, bags, or even accessories without losing their functional and aesthetic qualities.

Furthermore, the selection of women's products from recycled denim also has a socio-cultural motivation. Women's fashion is an extremely dynamic field, characterized by diversity and a rapid pace of changing trends. Thus, selecting worn jeans as raw material for developing recycled design into women's products proves to be a justified choice both aesthetically and functionally, as well as from a sustainability perspective. By transforming these seemingly outdated items into new and modern creations, a pathway is opened toward circular, innovative, and responsible fashion.

Hereby, are presented few models of women's garments developed in the concept of upcycling (fig.1-3). Each model structurally is divided in small parts that make possible to cut it from peeses obtained in recycling process.



Fig. 1. Outfit composed of a jacket and shorts made from recycled denim and patterns of the recycled denim jacket (Developed by E.Meghea)

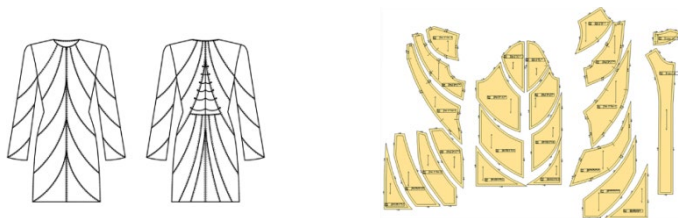


Fig. 2. Dress made from recycled denim and its patterns (Developed by E.Meghea)

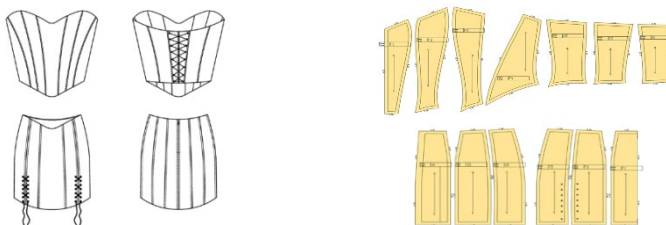


Fig. 3. Outfit composed of a corset and skirt made from recycled denim and its patterns (Developed by E.Meghea)

Conclusion. Structural analysis highlights that denim pants should not be seen merely as worn garments but as a source of modular resources, with each part capable of being transformed and reintegrated into new products. Their redesign offers multiple opportunities, from creating unique women's clothing to practical accessories. By valorizing each component, a circular design process is achieved, extending the material's lifecycle and reducing the ecological impact of the textile industry.

Denim's integration into a circular system demonstrates its potential to drive a shift toward sustainable fashion. Applying the 3Rs Redesign, Reuse, and Recycling reduces environmental impact, minimizes textile

waste, and fosters new aesthetic and functional possibilities in garment design. Worn denim is no longer mere waste but a valuable, renewable resource[6]. Structural analysis of denim garments shows that every component from panels and waistbands to pockets and metal accessories can be creatively repurposed into new garments or accessories. This approach supports circular economy principles and promotes responsible consumption [3].

Creating women's clothing and accessories from recycled denim highlights that fashion can be both creative and sustainable. Transforming old jeans into new pieces maximizes existing resources, encourages innovation, and extends the life cycle of materials, showing that garments can be reinvented rather than discarded, garments not merely as disposable items, but as materials with the potential for reinvention and extended lifecycle.

References

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