

CONGRESS PAPER
(Research Article)

Upcycling Designs of Women's Denim Trousers with Penture Method

Kadın Denim Pantolonlarının Pentür Yöntemiyle İleri Dönüşüm Tasarımları

DOI: 10.54976/tjfdm.1308232

Alınış (Received): 15.06.2023

Kabul Tarihi (Accepted): 30.10.2023

Derya Dastan Barsbey¹
Orcid: 0009-0008-9538-3441

Elif Aksan²
Orcid: 0009-0001-7686-3174

Demet Kitay³
Orcid: 0009-0000-6199-7180

Yunus Emre Deniz⁴
Orcid: 0009-0002-5536-4947

Şafak Dalman⁵
Orcid: 0009-0000-2061-4059

Nur Seçgin⁶
Orcid: 0009-0001-6934-1749

Mustafa Erdem⁷
Orcid: 0009-0007-8557-6517

İsmail Ege Kalkan⁸
Orcid: 0009-0001-3447-2132

Elçin Emekdar⁹
Orcid: 0000-0001-9964-0099

Umut Kıvanç Şahin¹⁰
Orcid: 0000-0003-3074-3633

^{1,2,3,4,5,6,7}Engineer, Loft Mağazacılık A.Ş.,
İstanbul, Türkiye

^{8,9}Research Assistant, İstanbul Technical
University, Faculty of Textile Technologies
and Design, Textile Engineering
Department, İstanbul, Türkiye

¹⁰Assoc.Prof.Dr., İstanbul Technical
University, Faculty of Textile Technologies
and Design, Textile Engineering
Department, İstanbul, Türkiye

Sorumlu Yazar (Corresponding Author):

İsmet Ege KALKAN
kalkani15@itu.edu.tr

Keywords:

*Upcycling, Penture, Unique,
Environmentally-Friendly, Denim*

Anahtar Kelimeler:

*İleri Dönüşüm, Penture, Benzersiz, Çevre
Dostu, Denim*

ABSTRACT

It is known that the word penture derives from the French word "penture". Its Turkish equivalent is translated as "painting". However, it has an artistic painting meaning in our language (Araç&Yerli, 2022). The penture was a symbol of richness in the past years. When we apply nature-friendly paints and penture technique on products that we do not use, it also aims to protect nature by upcycling. General purpose: To prevent textile products from going to waste in line with recycling and sustainability trends. Women's denim jeans which are unused have been gathered to be recycled with this study. The front portions of the pants and the back-applique pockets were decorated with trend pattern works. The pattern was created using water-based paints. Many different product designs were created using these tested studies.

ÖZ

Penture kelimesinin Fransızca "penture" kelimesinden türediği bilinmektedir. Türkçe karşılığı "resim" olarak çevrilmiştir. Ancak dilimizde sanatsal resim anlamı da bulunmaktadır (Araç&Yerli, 2022). Pentür geçmiş yıllarda zenginliğin simgesi olarak kullanılmıştır. Kullanılmayan ürünlere doğa dostu boyalar ve penture tekniği uygulandığında aynı zamanda ileri dönüşüm yaparak doğanın da korunması hedeflenmektedir. Çalışmanın genel amacı: Geri dönüşüm ve sürdürülebilirlik trendleri doğrultusunda tekstil ürünlerinin çöpe gitmesini önlemektir. Bu çalışma ile kullanılmayan kadın denim kot pantolonlar geri dönüştürülmek üzere toplanmış, daha sonra pantolonun ön kısımları ve aplikeli arka cepleri trend desen çalışmalarıyla süslenmiştir. Pantolonlarda desen oluşturmada su bazlı boyalar kullanılmıştır. Daha sonra desen oluşturulan çalışmalar kullanılarak birçok farklı ürün tasarımı oluşturulmuştur.

How to cite Kaynak gösterimi: Dastan Barsbey, D., Aksan, E., Kitay D., Deniz, Y.E., Dalman, Ş., Seçgin, N., Erdem, M., Kalkan, İ.E., Emekdar, E., Şahin, U.K. (2023). "Upcycling Designs of Women's Trousers with Penture Method", *Turkish Journal of Fashion Design and Management (TJFDM)*, 2023, SI(1): 01-08, doi: 10.54976/tjfdm.1308232

Kaynak gösterimi: Dastan Barsbey, D., Aksan, E., Kitay D., Deniz, Y.E., Dalman, Ş., Seçgin, N., Erdem, M., Kalkan, İ.E., Emekdar, E., Şahin, U.K. (2023). "Kadın Denim Pantolonlarının Pentür Yöntemiyle İleri Dönüşüm Tasarımları", *Turkish Journal of Fashion Design and Management (TJFDM)*, 2023, SI(1): 01-08, doi: 10.54976/tjfdm.1308232

1. Introduction

People who use this technique often use their furniture, their walls, their clothes to look unique, like paintings. They used this technique to apply manual labor, using a brush of various types of paints suitable for the desired surfaces. At the same time, we see it in the pincur archaic, classical and baroque modes of expression. This technique is a forgotten technique made by hand on various materials (DHA, 2020). This painting supports us to produce unique pieces using our technical creative power.

While the uniqueness and expressive power of each work varies depending on the artistic expression created by the artist and the discipline he uses; The resulting form, writing, sound, photography, screen, installation, performance, sculpture, painting, ceramics, etc. In artistic approaches, today, in addition to technique, an approach in which thought is dominant beyond mere painting and imagination is kept wide is seen (Akkol, 2018). It is common knowledge that an artwork's originality is crucial. The artist must use unique components that make up the piece, such as the figure, place, incident, and theme, when using traditional painting techniques. If one moves away from notions in modern painting, an expectation for the originality of thought and criticism grows (Araç, 2022).

Pentur is a handmade painting technique. Contrasting colors are used together in compositions inspired by nature and expressed with sensations. The hot-cold relationship was tried to be balanced with gray values. In compositions where the surface and depth phenomenon are achieved with plastic transitions, the pentur circulates over the entire surface with small-large brush strokes (Kodaman&Sarı, 2016). Penture, which has a significant role in the history of art, has experienced a wide range of material and technical uses throughout history in several societies. These discrepancies were looked at in the first section of this thesis. First, it is detailed how the penture was discovered and how it changed over time. The penture has a significant history in Western art. Later, in the Far East, in particular, the Chinese people's brief history and their usage of paint pigments are studied (Emir &Kavukçu, 2020).

The perception of art in Islamic art is also included, along with how it is reflected in painting. Although it seems to be of first-class importance in the design concept, in the design of products for use in the industry, such as textiles, the focus of personal tastes and personalized designs is more important today in terms of creative process, especially aesthetic safety (Önlü, 2010).

Clothing is primarily products prepared for the function of dressing. When we perceive clothing as a work of art, we can evaluate the artist's creation as a method of expression in which he presents his aesthetic concerns and visual and conceptual thinking with visual language (Arslan, 2007).

Women's denim pants, which were are worn-out and not used are utilized in our project. We used trend pattern works which were applied to the front parts of the trousers and the back-applique pockets.

In the design, blue and mid blue denims with 100% cotton fabric and 12/13- Oz/yd² weight were preferred. Two different patterns were applied to denim trousers with the penture method. Water-based paints were used in the pattern design. From these tested studies, multiple product designs were made.

2. Experimental Study

This method is especially applied to cotton-containing fabrics using water-based fabric dyes. While applying this technique on the fabric, after each layer printed fabric should be allowed to dry to avoid incorrect overlapping. When the dyeing process is finished, a piece of fabric should be laid on it and ironed with a heated iron at the maximum level.

2.1. Testing

Prior to testing all samples were conditioned according to ISO-139. Samples were tested for color fastness to light (ISO 105-B02), color fastness to rubbing (ISO 105-X12), abrasion resistance (ISO 12947-2), tensile strength (Grab Method ISO 13934-2), tear strength (ISO 13937-1), seam strength (Grab Method ISO 13935-2), and appearance after care (ISO 6330).

3. Results and Discussion

Color fastness to artificial light result is presented in Table 1. As can be seen from the table tested samples have very high color fastness to light performance.

Table 1. Color fastness to artificial light results.

Tablo 1. Yapay ışığa karşı ışık haslıđı sonuçları

	Rating
Color Change	4/5

Color fastness to rubbing test results are presented in Table 2. As can be seen the dry results is very high, but the wet result is mediocre. Because the penture technique is a surface application, very high wet rubbing performance was not expected. After-treatments including fixing agents, application may be added after coloration.

Table 2. Color fastness to rubbing results.
Tablo 2. Sürtünmeye karşı renk haslığı sonuçları

	Dry	Wet
Sample	4/5	2/3

Abrasion resistance test results are presented in Table 3. As can be seen, high abrasion resistance with very limited color change was achieved on different parts of the product.

Table 3. Abrasion resistance results.
Tablo 3. Aşınma direnci sonuçları

Sampling location	Cycles	Color Change
Crotch	20.000	4
Knee	20.000	4
Back	20.000	4

Tensile strength test results are presented in Table 4. All samples have shown high strength performance.

Table 4. Tensile strength results.
Tablo 4. Kopma Mukavemeti sonuçları

Sample ID	Peak Load at Break (kg/f)
Warp Sample 1	80,8
Warp Sample 2	86
Warp Sample 3	81
Warp Average	82,6
Weft Sample 1	42,8
Weft Sample 2	37,5
Weft Sample 3	42,3
Weft Average	40,9

Tear strength test results are presented in Table 5. All samples have shown high strength performance.

Table 5. Tear strength results.
Tablo 5. Yırtılma mukavemeti sonuçları

Sample ID	Average Tear Load (g/f)
Sample 1	6.340
Sample 2	6.267
Sample 3	6.350
Average	6.319

Seam strength test results and the failure types are presented in Table 6. Seams have shown high strength properties and the failures shows us the areas that should be strengthened if needed.

Table 6. Seam strength results.
Tablo 6. Dikiş Mukavemeti Sonuçları

Sample Taken From	Breakdown (kg)	Type of Failure
Waist Seam	74,3	Fabric Tear at Jaws
Zipper Seam	35,0	Fabric Tear at Seam
Hip Seam	51,2	Fabric Tear at Seam
Pocket Side Seam 1	48,3	Fabric Tear at Seam
Pocket Side Seam 2	45,5	Fabric Tear at Seam
Pocket Bartack Seam	16,2	Fabric Tear at Seam
Front Rise Seam	39,4	Breakage of Sewing Threads
Back Rise Seam	69,2	Fabric Tear at Jaws
In Seam	41,2	-
Side Seam	36,6	Fabric Tear at Seam

Appearance evaluation results are presented in Table 7. Sample has shown low shrinking after 1 and 3 washing procedures. They have shown high stain proof properties.

Table 7. Appearance evolution results.
Tablo 7. Görünüş Değerlendirme Sonuçları

Observation Made On	After 1 Wash	After 3 Washes
Waist	0%	-2,5%
Thigh	-0,7%	-2,5%
Calf	0%	0%
In Seam	-0,4%	-1,4%
Out Seam	-0,4%	-1,6%
Spirality	0%	0%
Color Change	4-5	4-5
Staining on Acetate	4-5	4-5
Staining on Cotton	4-5	4
Staining on Polyamide	4-5	4-5
Staining on Polyester	4-5	4-5
Staining on Acrylic	4-5	4-5
Staining on Wool	4-5	4-5
Seam Puckering	5	5
Free Running of Zip Fastening	Yes	Yes
Detachment of Trims	No	No
Pilling	4-5	4-5
Change on Prints	5	5
Pile Loss	5	5
Unraveling in Stitching	5	5
Corrosion on Metal Components	5	5
Delamination of Fused Components	5	5

4. Conclusion

We applied the method of upcycle which is now trending on the world. The penture method has been applied to the cotton denim products. Performance test were applied, and it was shown that high color fastness, abrasion resistance and strength performance were achieved. The result of our study was used to design a collection of 100 women's denim products. The designs and technique were noticed immediately and appreciated by female consumers.

Acknowledgment

This study is supported by Loft Magazacilik Inc. Design Centre under the Project # 160276.

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