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EXPLORATION OF QUILTING TECHNIQUES ON WASTE CUTTINGS OF DENIM CLOTH TO MAKE WATCH STRAPS

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Abstract

The textile industry produces large amounts of waste, including denim scraps that are often not optimally utilized. This study aims to explore the quilting technique as a creative method in using denim scrap waste into watch strap accessory products through an upcycling approach. The method used is an experimental-descriptive approach with stages of design exploration, manufacturing process, and evaluation of product results in terms of visual appearance, comfort, and usability. The results of the study show that the quilting technique is effective in processing denim waste into unique, artistic, and environmentally friendly products. The application of this technique within the upcycle framework not only reduces textile waste but also creates commercially valuable products with a new identity. This study is expected to contribute to the development of textile waste-based accessories and encourage sustainable design practices in the creative industry.

Keywords: ***denim, textile waste, quilting, upcycling, watch strap, sustainable design.***

INTRODUCTION

The fashion and textile industry is one of the largest contributors of waste in the world, including in Indonesia, with fabric scraps—especially denim—often not being utilized optimally. Denim fabric, which is popular for various products such as pants, jackets, and skirts, produces large amounts of scraps that generally become industrial waste. This is both a challenge and an opportunity in the world of sustainable design. One approach that has emerged to address this problem is the concept of upcycle, which is turning waste into new products with higher functional and aesthetic value. Unlike regular recycling, upcycle emphasizes creative transformation that gives a new identity to used materials and is in line with the principles of sustainable design. The quilting technique—the process of sewing several layers of fabric together—is considered to have the potential to support this concept because it allows the utilization of small fabric scraps into products with added value. The combination of quilting and denim waste opens up aesthetic and functional opportunities, for example in the development of sustainable accessory products such as watch straps. Watch straps, which are usually made of leather, rubber, or metal, can now be developed from upcycled textile materials that are more environmentally friendly and have high aesthetic value. Therefore, this study aims to explore the quilting technique as a creative method of processing denim fabric waste, with the hope of contributing to the development of sustainable accessory products and encouraging the application of environmentally friendly design in the creative industry.

Based on the background above, it can be concluded that the problem that occurs is the large amount of denim fabric waste from convection or jeans alteration services that are thrown away because they are considered to have no selling value. This study aims to explore the application of quilting techniques in processing denim fabric waste into functional and economical products, such as watch straps.

LITERATURE REVIEW

1. Exploration

Exploration is a search activity that aims to find and explore new knowledge about an object or situation in depth. According to Hasmar et al. (2021), exploration is carried out to find information, knowledge, or potential that is not yet known, while Haniefan and Basunanda (2022) state that exploration aims to collect various sources

of genetic diversity. From these two opinions, it can be concluded that exploration is a systematic effort to gain a broader and deeper understanding of something that is not yet fully known.

2. Waste

According to (Widjajanti, 2009) waste is garbage produced from industrial and household production processes, better known as garbage. At a certain point, its existence is not desired by the environment because it has no economic value, and according to (Sartika et al., 2020) waste is any type of residual material or waste produced from technological processes or natural processes, the existence of which does not provide benefits to the environment and has no economic value.

a. **Types of Waste (Lismiatun et al., 2021):**
   Liquid waste:In liquid form, easy to move (example: used washing water).
   Waste gas:In the form of smoke, spreading widely (example: vehicle emissions).
   Solid waste:Dry and immobile (examples: food waste, textile waste).

a. **Types of Textile Waste (Izzal, 2023):**
   Post-consumer waste:Clothes that are not worn because they are damaged or not trendy.
   Pre-use waste:Production waste such as fabric scraps, leftover thread, defective fabric.

b. **Patchwork (Rosdiana et al., 2018; Dewi et al., 2020; Zamhari et al., 2022; Anggraini, 2022):**
   Leftover fabric scraps from the production process.
   Can still be used for crafts or business.
   If not managed, it has the potential to pollute the environment.

c. **Characteristics of Patchwork Fabric (Mulyani et al., 2021):**
   Small size.
   Irregular shape.
   Random motif.
   The sizes are not uniform.

d. **3R concept (Helmi et al., 2018; Eprianti et al., 2021):**
   Reduce:Reduce waste.
   Reuse:Reusing used items.
   Recycle:Recycling waste into useful products

3. Denim

According to Hardisurya (2011), denim is a woven fabric with a twill or diagonal striped structure made from colored weft yarns and undyed white warp yarns, resulting in a distinctive appearance on the surface of the fabric. This twill structure makes the color of the yarn more prominent, and the name "denim" itself comes from the city of de Nimes in France which is the place of origin of its production. Meanwhile, according to Fahruroji et al. (2020), denim is a type of fabric weighing more than 350 g/m² which was originally made from 100% cotton yarn. Over time, denim has also been produced using a mixture of cotton and polyester yarns to increase the flexibility and durability of the fabric.

4. Quilting

According to Mahmud et al. (2023), quilting is a technique of using fabric as decoration on clothing with the characteristics of a raised surface and appearing three-dimensional. Meanwhile, according to Nafisa (2021), quilting is a technique of making ornaments by combining small pieces of fabric known as patchwork quilting. These ornaments are usually made from patchwork fabrics that have variations in color and shape. Quilting is also known as a form of folk art. The word "quilt" itself comes from the Latin culcita, which means "filled sack," and has two meanings, namely as a sewing technique and as an object in the form of a bed cover consisting of three layers of fabric.

types of quilting according to May et al. (2023):

1. **Half Square Quilting and Quarter Square Quilting**
   a) *Half Square Quilting:*Using squares divided diagonally, half light and half dark.
   b) *Quarter Square Quilting:*Combining three types of fabric in one block with triangle and quarter square shapes, creates a "setting on point" pattern.
2. **Crazy Quilting**

a) Made of various types of fabric (cotton, silk, velvet, satin) with asymmetrical stitching.
b) Consisting of irregular pieces of fabric in a block, often decorated with decorative stitches such as zigzags.

3. **Coin Quilting**
   a) Also known as Chinese Coin.
   b) Using rectangular pieces of fabric arranged vertically neatly on a plain background.
   c) Popular because the process is fast and easy to implement.

RESEARCH METHODOLOGY

The research method used is an experiment with a qualitative approach, where the researcher becomes the main tool in collecting data through triangulation, namely a combination of interviews, observations, and documentation. This approach focuses on inductive analysis to develop themes from the data obtained, so as to gain a deep understanding of the phenomenon of the accumulation of denim fabric waste that is not optimally utilized. Data collection techniques include direct observation of denim tailors at Warung Jeans to determine the amount of waste, interviews with tailors and admins to obtain information related to waste and visitors, and documentation in the form of notes, pictures, and recordings that enrich the data. Literature studies are also conducted to support understanding of the research object. The data collection process is carried out systematically using various tools such as gadgets, books, and laptops, as well as questionnaire surveys to validate data and support design decisions. Data analysis uses an inductive approach, which starts from data collection in the field, continued with analysis and theory development, then drawing conclusions to produce a watch strap design based on denim fabric waste.

RESULTS AND DISCUSSION

RESEARCH RESULT

MATERIAL ANALYSIS

The material used is denim, a strong cotton-based material with unique surface characteristics that can experience color changes (fading) due to treatments such as chemical reactions, impacts, or friction. The type of waste used is pre-washed denim waste with a thickness of 14oz from unused convection. This waste is processed into watch straps using quilting techniques as an effort to reduce denim waste.

Figure 1. Types of Waste Used

EXPLORATION

Initial exploration

Initial exploration as a form of first step taken to determine effective quilting techniques in processing denim fabric waste, this initial exploration includes types of quilting techniques: Crazy quilting, Half Square Quilting, Quarter Square Quilting, Coin Quilting.After exploring the denim scraps, it was found that the most suitable quilting technique for sewing denim scraps from jeans stalls is crazy quilting. This technique is very effective because it is able to combine scraps of various sizes, from small to large, so that all fabric waste can be utilized optimally.

Advanced Exploration

Advanced exploration is the next stage after determining the most effective quilting technique in utilizing denim fabric waste. In this stage, re-determine the size of the dacron sheet with what thickness will give a raised effect on denim fabric waste. Based on the results of quilting stitches with the crazy quilting technique using sheet dacron with a thickness of 2 oz, 4 oz, and 6 oz, it can be concluded that the use of dacron with a thickness of 2 oz is highly discouraged because it does not provide a raised effect on the stitches, a thickness of 4 oz is highly

discouraged because it provides a raised effect on the stitches and is not too thick, while a thickness of 6 oz is highly discouraged because it provides excessive thickness.

Selected Explorations

Figure 2. Selected Crazy Quilting

It can be concluded that the use of 4 oz thick dacron is the most ideal choice. This thickness is able to provide a thick enough effect on the stitches without causing an excessive or too thin impression, so it is very suitable for use in processing denim fabric waste to create a proportional and aesthetic quilting appearance.

Terms of Reference (ToR)

This product develops a quilting technique on denim fabric waste to be made into a watch strap with an attractive texture and visual. The strap was chosen because it can maximize small denim pieces (2x10 cm) and display a unique crazy quilting pattern. The design uses 14oz denim pieces from Warung Jeans with a crazy quilting technique to maximize waste. The product functions as an environmentally friendly fashion with a sustainability concept, combining irregular colors and patterns to make it attractive and comfortable to wear, and using additional materials such as dacron sheets. Design limitations include targeting women aged 18-35 years, products in the form of analog watch straps, priced at IDR 80,000-100,000, and colors that match the available patchwork: black, dark blue, gray, and light blue.

Final Product

Figure 4.3 Final Product

The watch strap is designed from dark blue and light gray denim fabric pieces arranged diagonally using a quilting technique, creating a distinctive geometric stitching texture. The strap is equipped with three fastening loops to keep the ends neat when worn, while adding a visual accent. The size is adjusted for everyday comfort and aesthetic proportions. The use of denim waste and quilting emphasizes the product's concept as an environmentally friendly fashion accessory with artistic value.

CONCLUSION

Strong cotton-based denim material with unique characteristics such as color change (fading) is used as the main material. Unused pre-washed denim waste with a thickness of 14oz from convection is processed into a watch strap using a quilting technique to reduce textile waste that has been considered worthless. Through exploration of various quilting techniques, crazy quilting was chosen because it is the most effective in combining pieces of denim fabric of various sizes so that waste can be utilized optimally. Further exploration determined that the use of 4oz thick dacron gave the best embossed effect on the quilting stitches, producing a proportional and aesthetic texture without being excessive. The final product is a watch strap with pieces of dark blue and light gray denim arranged

diagonally using the crazy quilting technique. This design combines function and aesthetics, equipped with three loop fasteners to maintain neatness and comfort of use. This product reflects the concept of environmentally friendly fashion with high artistic value, while providing a creative and economical solution to the problem of denim waste in convection. Overall, this research has successfully explored and applied quilting techniques to process denim waste into functional and valuable products, in accordance with the aim of reducing textile waste through creative utilization.

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