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A Study on the Design of Accessories through the Concept of Reincarnation

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Keywords

reincarnation, waste leather,
upcycle, sustainable, C2C

Abstract

This study aims to explore the unethical issues in leather processing and to develop designs of leather products based on the concept of reincarnation by ecosystem circulation. The method used in this research include the review of previous literature and the design process for development fashion accessories using waste leather. The design process comprises collecting waste leather, classifying waste leather by type, color, and size, and developing leather products according to line carnation method. For this research, the material was limited to waste cowhide leather collected from leather workshops and leather product factories. The leather pieces were divided into typical and atypical types and developed leather accessories based on the leather piece's color and size. A twill brooch, four-string bracelet, a brooch using the four-stringed leather strap and mini handbag designs were developed using regular type waste leather. An armband of abstract patterns and a cellphone case with graffiti pattern using irregular type over-splitting waste leather. The environmental issues in design are observed as part of understanding the significance of this study. Development of waste leather accessory can expand the usability of the waste leather as well as increase the product value by creating limited-line editions. By understanding the role and benefits of sustainable upcycling, this research suggests an efficient way to use waste materials in fashion to coexist with the natural environment.

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I . Introduction

1. Research purpose and significance

5000 years ago, there were records of Egyptian paintings of caves, leather trimmings, leather sandals, and leathers. In the past, it was at the level of using buds, leaves, chicken poop, piss, dog brain as medicines and chewing or batting directly with human teeth. Beginning in 1884 with the chrome tanning method invented by Augustas Schultz, it produced soft leather with increased temporal efficiency. However, the use of chromium, a large amount of water, salt, and lime containing carcinogens and the chemical treatment to neutralize strong alkaline components have become economic, environmental and ethical issues.

This study aims to explore the anti - ethical problems of leather processing and to develop a leather accessories design based on the concept of reincarnation by ecosystem circulation.

In 1987, the United Nations World Environment Development Committee said in its "Our Future of the Future" report: If we can not solve the environmental pollution problem, we warn that the health, prosperity and ecosystem of mankind will be in serious danger, and the urban life will be a difficult place to endure. In the twentieth century, when the industrial revolution occurred, mass production led to the depletion of resources and the massive waste of sludge. It broke the link of natural circulation.

It is estimated that the number of 'plastic pieces below 5 millimeters' floating in the sea is about 51 trillion. Diseases such as carbon dioxide emissions, dioxins and other pollutants, and Minamata disease caused by mercury poisoning have raised awareness of environmental pollution.

As a result, there has been a movement to minimize the waste itself, and environmental groups such as Green Peace and Green Party have emerged. Also, terms such as reuse, recycle, upcycle and sustainable design have started to appear. In addition, 'eco-efficiency' emerged among entrepreneurs. It transforms the human

industry into an industry that considers economic, environmental, and ethical issues(William & Michael, 2003).

Seoul's daily waste amounts to an average of 42,000 tons, and Korea's one-year garbage waste amounts to 75,000 tons . The recycling rate in Seoul is 66%, which is much higher than New York (26%), London (25%), Paris (35%) and Tokyo (18%). But the recycling rate is less than half that of developed countries(Yoo, 2017). The circulation to more valuable is not achieved.

Chapman pointed out that sustainable design has a new and ambitious design mentality that takes the future into account, but lacks an innovative approach. And that the cause is a lack of philosophical depth (Chapman, 2005).

In McDonough and Braggart's "Cradle to Cradle", "What if the industrial revolution emphasized the importance of the whole rather than the individual, and what happened in an Asian society that believed in circular values like reincarnation and reincarnation? (William & Michael, 2003). From this point of view, there have been movements that take the system as a natural circulation system, not a concept of confrontation between industry and environment. From the stage when a new product is created, the main purpose is for people to have a understanding of products and a story to pursue sustainability rather than one-off and to cycle. It is linked with the reincarnation of the following meaning. 'A material that underwent creation, change, and extinction and its inherent value is reincarnated into new forms and values through the effects of circulation and previous life(Cho & Chung, 2015).

More than 90% of the materials used in consumer goods are destroyed at the same time the product is manufactured. The product itself is no more than 5% of the total raw materials used for production and distribution (William & Michael, 2003). In the case of leather, it is made using a large amount of water, salt, and lime. In this process, contaminated water requires a lot of energy and effort to treat wastewater. Still, in many countries, this wastewater has been left to

permeate ecosystems. In particular, the heavy metal chrome used to dye leather is exposed to workers, and it takes an average of 20 years to develop cancer. For that reason, the company says it has a policy of hiring only people who are over 50 years old to handle hazardous materials (William & Michael, 2003).

However, refusing to use only natural leather can not be a solution to environmental problems. Artificial leather has emerged as a substitute for leather by ethical thinking. Artificial leather, however, uses energy as well as natural leather and emits toxic substances. Artificial leather also contains a large amount of plasticizer, stabilizer, adhesive, antioxidant and the like. Because it is cheap in price, it is mainly used in fast fashion, and the disposal cycle is fast and does not disintegrate in 1 ~ 2 years consumption cycle. It is also impossible to recycle it, and if it is discarded, it releases a large amount of pollutants such as dioxin (Kim, 2016).

Therefore, we have to worry about the nature-friendly production method of leather. Vegetable leather made from natural vegetable tanning has very little contamination compared to chrome oily leather.

However, we can not actually produce only vegetable leather in the leather industry, which is a representative industry for recycling by-products from the slaughter process of a huge livestock industry. To produce only untreated leather to make it less bad is to be able to eradicate a variety of aesthetic pursuits, creativity, joy, and emotion of human beings. Therefore, along with developing efficient and naturally friendly production methods of leather using chrome and other oils, we need to develop a way to reintroduce discarded parts of the leather being produced into the most valuable products.

Cowhide, which occupies more than 80% of the

world's natural leather, is an indispensable resource after separating the meat for edible purposes. There is a need for further research and interest in the use of leather.

Up to now, most studies have focused on up-cycling products that are limited to clothing. Han(2014) and Cho and Chung(2015), who have developed products only in terms of design using waste leather, have focused only on the presentation of process models such as case studies on sustainable use of leather. This is the resurrection of waste leather by the concept of more advanced reincarnation in upcycle. In other words, it is a new life design, and ultimately a step that can keep the ecosystem of circulation where the earth and man can live together. This study aims to develop the design of leather accessories through the reincarnation concept.

And more active use of currently produced raw materials will result in a decrease in the rate of new raw dressing. When the size of the material to be up-cycled is less than 5 cm, it is often discarded. By developing a design that can utilize these small waste leather as accessories, if students use the program in experiential learning and awareness-raising programs, it will be an opportunity to simultaneously implement education and implementation of ecosystem protection.

2. Research methods and scope

This study was carried out with theoretical research and development of accessories using waste leather. The theoretical study examined the meaning of reincarnation and the leather production process. Leather was limited to cowhide. accessories development was divided into typical and atypical leather pieces(Table 1) according to the type of collected leather, and their designs were

Table 1. Waste Leather Classification

Type of waste leather	Typical Waste Leather		Atypical Waste Leather	
	Remnants of leather after iron-working	Inner split by avoidance	Various sizes of waste leather	over-splitting waste leather

developed by classifying their colors and sizes. In the sense of reincarnation, design that does not fit the natural circulation system was excluded.

In the sense of the natural cycle of reincarnation, the collection of waste leather was made from a workshop, a leather club, and a leather product factory. In addition, the toxicity of the bond penetrates toxicity to nature, so it is made of a non-toxic aqueous bond. Where possible, they were fixed with a needle and a needle instead of a bond to minimize environmental contamination. In other words, considering the process to be circulated beyond the once or twice used step, we will design using leather sculptures that become garbage from the production stage.

II. Theoretical background

1. Concept of reincarnation

Social and ethical concepts emerged due to environmental problems. First, in a lexical sense, it means "to recycle waste" or "to use ideas and methods again." The advanced upcycling in recycling is a combination of 'upgrade' and 'recycle', which means that the recycled product is re-created by adding design or utilization to the product. In this concept, sustainable design is the addition of ecological world view and environmentally friendly concepts. There are various approaches to sustainable design such as eco design, lifecycle, resolvable design, biomimetic design, C2C design, sustainable interaction design, and emotional sustainable design (Chon, 2015).

In particular, as the 2007 campaign catchphrase for international environmental protection group Greenpeace is 'Believe in reincarnate', the relevance of sustainable design and reincarnate is very deep. The following elements are required when assigning reincarnation to sustainable design; Input material (past), use(present), material re-birth(future) after use . In other words, the current positive use value should be linked to future value. In reincarnate, 'incarnate' means reincarnation by combining with 're' in the sense of implementing

thought or character. In other words, a reincarnate is a reincarnation of a material and its inherent values that have undergone creation, change, and extinction to new forms and values through the effects of circulation and previous life (Cho & Chung, 2015).

As the samsara of the Indians refers to the reincarnation, it is the theory that human beings live countless lives depending on the outcome of their actions. In the end, in Indian thought, time is understood not as a beginning and an end but as an infinite continuous stream(Ryu, 2003).

Reincarnation means survival and a new 'resurrection'. The reincarnation of Confucianism, Buddhism, and Taoism is a practice of sustainable design, and is not a decline in value at the cycle stage but a life that revives. The reincarnation, which was also a common postmortem idea of ancient Indians, has the following meaning; the wagon wheel revolves around the wheels of life and death according to the achievements of human beings, such as turning round and without end (Cho & Chung, 2015). In other words, reincarnation is not a simple cycle but a cycle of worthwhile change of creation, growth, change, and extinction (Figure. 1 Comparison of concepts of circulation and reincarnation).

2. Leather

1) Types of leather

Leather is largely divided into natural leather and artificial leather. Natural leather includes cases where the thickness of the applied or laminated leather is less than 0.15 mm. Artificial leather is an animal skin that has undergone coating, laminating, and recombining processes, and has a thickness of 0.15 mm or more. There are many types of natural leather that can be produced in most mammals, including cows, horses, sheep, goats, ostriches, pigs, crocodiles, salmon and eel.

The cow leather is a material that recycles by-products from the slaughtering process for edible purposes. Cow leather is a non-ethical, non-ecological leather that slaughters to obtain rare animal skins.

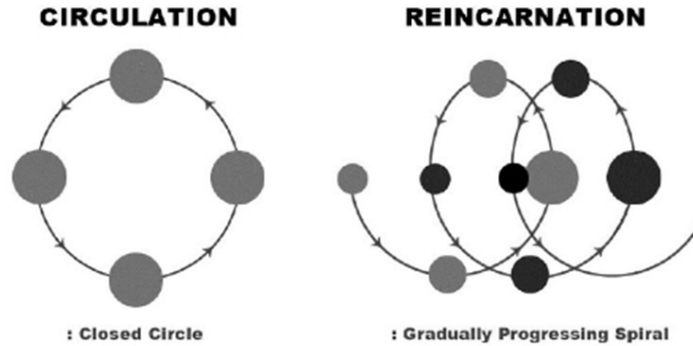


Figure. 1 Comparison of Concepts of Circulation and Reincarnation
(Cho & Chung, 2015, p.481)

Table 2. Classification of Cowhide

Type		Characteristic
Cow skin	Ox hide	The male skin
	Bull hide	The untranslated male skin more than three years old
	Kip skin	Cattle skin for 6 months ~ 2 years
	Calfskin	Calves skin within 6 months of age
	Cowhide	The female skin

Therefore, this study was selected as the best material for the concept of recycling and reincarnation. In particular, more than 80% of the world's natural leather is cowhide. The classification is as follows: The male skin is ox hide, The untranslated male skin that is more than three years old is called bull hide, The skin of cattle for 6 months ~ 2 years after birth is kip skin, calfskin of calves within 6 months of age, The female skin is called cowhide(Table 2).

2) Leather production process

First, developed countries use human or skinning machines to peel off their skin after a humanitarian slaughter process. In the second step, chemical treatment or salting is done within 6 hours to prevent decay of the hides. The amount of salt is 25-35% of the skin weight. Third, in order to remove hair, put the skin in a drum filled with sulfuric acid and other chemicals.

Fourth, acid treatment at a pH suitable for storage. The fifth is the tanning stage, which is processed in one of vegetable, chrome, or other oily. At this time, a large amount of polluted wastewater is generated in the chrome-oily phase which is harmful to human body. The sixth stage is the surface treatment step, in which the leather is colored and patterned to enhance the completeness of the product. It is to increase the flexibility by controlling the acidity, base, and moisture of the leather so that the color is well coated with the re-oil. The next step is to apply the desired color from the dyeing. The last step is to improve the touch and shine by adding, injecting and adding the oil inside the leather. After the drying step, the last step, the painting, gives a pattern, color, texture, and gloss (Francesca, 2013).

The leather is classified according to the tanning method, which is divided into Chrome Tanned and

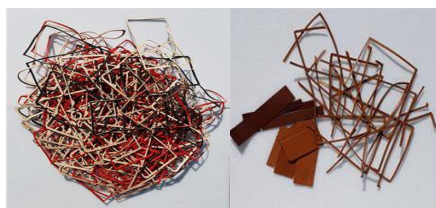


Figure 2.
Remnants of Leather
after Iron-working



Figure 3.
Inner Split
by Avoidance



Figure 4.
Over-Splitting
Waste Leather

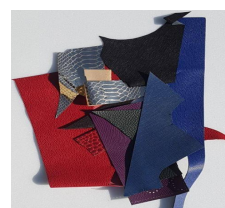


Figure 5.
Various Sizes of
Waste Leather

Vegetable Tanned. Chrome Tanned was developed around 1850 and is the most commonly used method to date. Vegetable Tanned is tanned with vegetable tannin, mainly used for hides and fine leather. Vegetable Tanned Leather is a natural cyclic method that does not leave toxic substances. It is the most natural-friendly leather material.

3) Waste leather

The waste leather was used as the material from the factory, leather workshops, leather clubs. In the leather product factory, the mold of the desired product is cut and the remaining leather is discarded in the form of a molded shape (Figure 2). Or inner split waste leather (Figure 3), waste leather (Figure 4) that was over-splitting when the leather was avoided, was being discarded. In the leather workshop and leather-related venture clubs, mainly irregular pieces of fine quality were being abandoned (Figure 5).

Atypical waste leather is expressed abstractly with pictorial expressions that utilize the shapes that have been detached from the process of escape. Typical waste leather was designed by weaving, winding, and engraving.

III. Main subject

To remove the decay and hair, chemical treatment or salting treatment is performed, and the tanning step is performed by one of vegetable, chrome and other oily. At this time, the vegetable tanning is a natural-friendly

way to paint or carve directly through individual work. On the other hand, the problem of chrome oil, which discharges a large amount of contaminated wastewater, becomes a problem. It is continuing the movement to solve the environmental problems of the Republic of Korea. A few years ago, the Ministry of Trade, Industry and Energy, Republic of Korea (MOCIE) introduced chrome adsorption enhancer leather application technology to reduce drainage in leather chrome tanning process. In the Netherlands, the "Sustainable Apparel Industry Agreement" was signed in 2016 to prevent child laborers working in hazardous working environments for the sustainable apparel industry and the production of fabrics that pollute the environment.

In particular, MAPSZ, an eco-friendly apparel brand, is making abandoned salmon leather, which uses cyclical energy in the process (Figure 7). For example, hot water uses geothermal energy and electricity uses hydroelectric power (Cho, 2017).

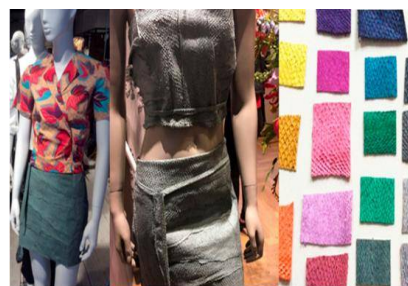


Figure 7.
The Cloth with Salmon Skin

However, even if the waste is safely contained in the ecosystem, if the exponential growth pattern is observed, it will adversely affect the system beyond the marginal capacity of nature. The narrow design that only pursues efficiency and practicality considering only environmental problems will result in suppressing the freedom of human beauty, emotion, and enjoyment of creation. Also, as Stella Mccattney designer, refusing the use of natural leather for animal protection and using artificial leather may result in adverse effects that produce more pollutants and wastewater in the production process and do not decompose spontaneously.

1. Design Development

1) Development of typical waste leather accessories

First, with the use of typical waste leather, the leather pieces remaining after the ironing of the cell phone case were twisted with a rectangle of width of about 2 mm and fabricated a brooch(Figure 8). On the reverse side, the waste leather collected in the splits due to the avoidance remained mainly the innermost inner split. This is not good for durability, so we decided to use it as a reinforcement inside the surface. The metal pins and the leather sculptures were fixed with a needle and thread for the convenience of separation in a sustainable dimension. The shape protruding from the rectangular lung leather was utilized as it is. Due to the structural shape of the cell phone case, the part that

needs to be cut again has become a new unique shape. This gave a point to the simplicity of twill. In addition, the three-dimensional shape of the center are represented by different sizes and lengths of the vortex pattern and the three-dimensional curve shape.

This means that in circulation and reincarnation, human beings turn and turn around the wheels of life and death.

Second, after working with cellphone case mold with 4-line weaving bracelet, We have tested various types of weaving in sample production with the remaining typical waste leather. As a result, the back of the leather strap was visible or the thickness was not constant. So we made waste leather to a certain thickness and made a 4-line weaving with no visible back side. The colors are red, dark green and dark brown. The 4-line weaving process is a wrapping method that is wrapped around each other. This means that the circle shape of the bracelet, together with the circle and the wheel of the life and death(Figure 9).

Third, a second brooch with a four-string weaving strap was used to symbolize reincarnation in a circular shape. The colors are red, dark green. The quadrangle of the waste leather protruded in the process of making the circle, and it was expressed as the element which changed the circle shape. The brooch was also secured with a needle and thread for the convenience of separating the metal pins and the leather sculptures from the sustainable dimension (Figure 10).

Fourth, a mini handbag with 2mm wide square



Figure 8.
Twill Weave
Brooch



Figure 9.
Bracelet



Figure 10.
Four-String Weaving Strap
Brooch



Figure 11.
Mini Handbag

brown waste leather stitched on the body and hand stitched. Its bottom and inlet sides consisted of 2.5 x 5 cm of waste leather. In addition, the handle and the bottom angle are made of dark brown 5.2 x 10.2 cm rectangular worn leather (Figure 11).

Besides, a gold rivet, buckle, and magnet adjust were used, and a suede lining was used.

2) Development of atypical waste leather accessories

The atypical waste leather was developed as a scabbard that was not able to be sewn, and a scarred leather that was produced in the process of being thinly avoided.

Fifth, using atypically torn over-splitting waste leather that occurs in the process of thinning the embossed leather to 0.3mm, it expresses the reincarnation, which is a valuable change of generation, growth, change, and extinction of cherry blossoms that are blooming every year in trees (Figure 12). The colors were light purple lilac, white, pink.

Sixth, an arm band was fabricated (Figure 13). over-splitting waste leather with 0,3 mm thick sky blue, purple, white, and deep blue colors. This was to express the representative symbols of the natural cycle, sky and arithmetic.

Seventh, the cellphone case, the leather workshop and the leather club, the size of the cell phone to the size of the cell phone died, I cut the base. The irregularly left waste leather was hand-stitched with various sizes of 3 x 5mm, 1,5 x 2mm, 2,5 x 5mm, and 3 x

3.5mm. This gave value to being from being discarded (Figure 14).

IV. Conclusion

In the twentieth century, when the Industrial Revolution took place, mass production led to a depletion of resources and a massive waste of sludge. It also broke the link of natural circulation. The natural cycle of birth, growth, ageing, and extinction is reincarnation. Sustainable design is a concept that came from the western world. However, recent environmental consultation forums and movements seek to find their philosophical depth in an Asian society that believes in cyclical values like reincarnation.

Also, Dubuffet, Duchamp and Picasso showed a reincarnation that collapsed the fragments around us to give life and gain the value of art. The rebirth of the material is not only about returning to a new form of rebirth, but also a spiritual rebirth. In this sense, no matter how small the material can be reintroduced into the life cycle, through a transition to a new value, we can solve environmental problems and win people and nature. In addition, we will be able to create a path of mutual benefit that can feel the joy of application and creation.

As an alternative to natural leather by ethical thinking, artificial leather production is creating more environmental pollutants. This is a low-cost, short-circulation cycle that is quick to discard and is



Figure 12.
A Coin Purse

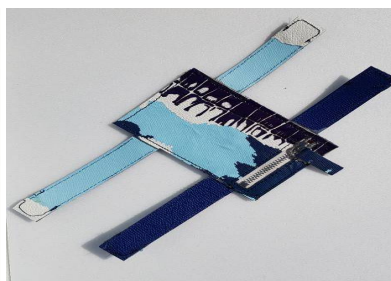


Figure 13.
Arm Band



Figure 14.
Cellphone Case

not biodegradable. In the current product production system, natural wastes will be overloaded if they exceed the marginal capacity of nature. In addition, pursuing only efficiency and practicality in environmental problems is to ignore the values that affects various aspects positively by eradicating human aesthetic pursuit right. Therefore, more active use of currently produced raw materials will result in a decrease in the rate of new raw dressing. In the sense of cycling through worthwhile change, extinction is more effective in products where there is a separation of the naturally degradable material and the non-degradable material at the time of disposal.

In this sense, this study classified the types of waste leather and divided them into typical and atypical types. The type of lung leather was classified into accessories.

The typical waste leather accessories represented the following. 'Circle means circle and life' and 'swirl pattern'. The remaining pieces of leather from the mold work were made of a brooch woven twill with a rectangular strip of about 2 mm in width, a 4-line weaving bracelet, and a 4-string weaving leash. The mini handbag was made by hand stitching in the form of three pieces of typical waste leather piece.

The atypical waste leather accessories have been developed with atypical over-splitting waste leather that occurs during the process of thinning and thinning to the extent that sewing is impossible. The arm band was designed to be able to accommodate cards and coins, and to represent the symbol of the natural cycle, sky and arithmetic. The cell phone case hand stitched the pattern and initials in the size of the leather that was given in the leather workshop and the leather club. This gives the value of being in being discarded.

In order not to be another cause of environmental pollution in the process of circulation and reincarnation, we have developed the accessories by utilizing the shape of the remaining waste leather as

much as possible. This is an artificial and chemical modification. This is designed in consideration of the pollutants and carbon-generating substances generated during the manufacturing process. This is the execution of reincarnation.

The development of waste leather utilization accessories of this study not only increases the limit of utilization of waste leather, but also enables the development of highly efficient commercial products with limited lines. It will also be a good example of students' experience of sustainable upcycle and cyclical upcycle that can recognize humanity's current issues such as global warming caused by waste materials and coexist with nature.

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