

國立交通大學
應用藝術研究所
碩士論文

植物質感在紙與織品上的再現

Representation of Plant Texture in Paper and Textile



研究生：王鈺喬

指導老師：鄧怡華教授

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ABSTRACT

Experiencing and representing unrecognized material is the ability which designers should be provided within a design process. Discussing interesting points and any relationships between the material, technique and product can develop designers' personal taste and style when they design. For me, material exploration is the most important process in design process. This study shows the exploring process of material making to know more about the relationship between material and design.

Looking at different combinations of paper, textile and plant texture through handmade prototypes will be the focus in this project. With detailed recording, there will be some critics of every work and design. Moreover, the influence of my thinking and a logical rule of this project will be defined after this exploring process.

A set of material collection with 36 materials has been created in this project. They present the combination of plant texture transformation, paper and textile techniques. Thereafter, this study demonstrates a product design process in order to achieve the application of this material collection. Nevertheless, this project develops a connection with raw material exploration and design process. It also provides a new and complete process for designers.

Keywords : Plant, paper, textile, texture, material, transformation

摘 要

在設計的過程中，體驗材料的使用並發掘其未知的樣式與感受，是現在設計師應具有的能力；而材料的實驗、手作的感受、質感的轉換、斟酌工藝與產品間的關係，在作品中交織出特殊的拼湊，在平凡事物中析出新鮮的發現，都可以增進設計師的品味能力與體現個人風格。爲了瞭解材料變化的可能性，與其設計之間的關聯，本創作藉由對材質的設計來探索材料使用時衍生出的面貌。

以呈現植物質感爲主，利用織品概念與其編、織、縫、綁等多重組合，來表現紙的不同風味，並陳述這三者間的對話。感性的手工創作中述說對紙與織品的情感摸索，理性的分析歸納來組織一系列質感創作作品。創作過程中對每個作品詳細記錄並加以評論，藉此更瞭解自己的思考過程與轉變。

在系列質感設計中，每個作品包含了植物生長型態與現象的想像與轉化，運用紙的不同特性、織品的排列構成如重複、交疊、大量等概念，發展各種作品的可能性。後續將系列質感創作延伸至產品設計，表現於玻璃杯套中，呈現如何將質感轉化爲產品設計的方法，提供質感與產品之間的關行性。此創作包含完整的過程與想法記錄，以及對過程的討論與建議，並提供設計師一創作思考的方式。

關鍵字：植物、紙、織品、質感、材料、轉化

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來到 iaa 似乎轉眼間便過去，不知不覺也進入了尾聲。自己來來去去，也看著大家來來去去，兩三年的時光很短暫，但因為遇見大家而變得不一樣，雖然短暫，卻很實在。

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謝謝陪伴我的 iaa94，雖然相聚時間不多，即使我在英國的日子，總是會收到大家的關心與一人一句話的明信片，讓我好感動；謝謝 iaa95，回新竹遇見你們是我今年最開心的事；謝謝靈光 Lab 的采芳、丁丁、佳志，跟你們合作總是笑聲不斷，在困難的時候也可以分擔工作；謝謝我的室友小猴、公主，有你們的生活很活潑可愛；也謝謝彥翔、士堯、Q 毛、秀涵、亭佑、小黑，和你們聊天可以變得有活力；也謝謝阿福，還有其他臨時被我叫住、給我建議與意見的人，有你們我的創作才可以順利完成！

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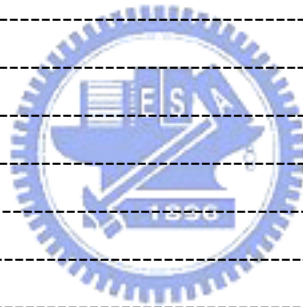
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1. Introduction

The first chapter starts from the background of material exploration in design. Then, some of my work done before and designers' work will be introduced here to describe my interest of material exploration. Besides, the motivation, objectives and outline of this project will be defined in the following page.

1.1 Background

Material in product design

Creativity can first be seen during the stage of material exploration in design process. May it be an artist, a product designer, a jewelry designer, a fashion designer; it is a fact that material control is necessary for designers.

Using materials is always the most important way in my design process during industrial design education. Ideas can be pouring out of brain through the act of using both hands to make objects. After several experimental projects, an interest of mine has been found in material with its challenge and surprise during the exploring process, and the sense of achievement within the discovering. Idea and way of thinking is also assured through this type of process.

Combination of Two Materials

Inspired by a Dutch designer, Hella Jongerius's work (Fig 1.1), the Embroidery Chair (Fig 1.2) made in an Oriental Design Project. is about elements' application of Oriental culture, for finding out an alternative way of design that represents our culture. Traditional Chinese artistry, embroidery, is used as my design element. The embroidery is not only a kind of artistry, but also an old craftsmanship. This craftsmanship is created on modern materials such as acrylic and several sewn old-fashion patterns on it. Furthermore, using concrete as the other base material to sew patterns on it (Fig 1.3) is a new idea to see what will happen with this combination. Obviously, there is a big difference between these two projects, such as the different process of making the product, texture, images, etc, because of the different characteristics of materials.



Fig 1.1 Hella Jongerius



Fig 1.2 Embroidery Chair



Fig 1.3 Sewing pattern on concrete

Exploration of Material Applications

Self-destructive Object is a special project run by Noam Toran (Noam Toran, born 1975, a designer combined artist commissions with set designs for theatre and film) during my education in Royal College of Art. Two works had been done concerning this project, one is “Moldy Body”(Fig 1.4) made by decade fruits with growing mold and the other is “Sun Tattoo”(Fig 1.5) made by tanning skin under sunshine . Both of them are exploration of material applications.



Fig 1.4 Moldy body



Fig 1.5 Sun Tattoo

Material Exploring Projects from Contemporary Designers

In the field of product design, materials are used in not only necessary but also innovative situation. There are some projects from contemporary designers who provide creative ways of using materials. For example, Stampcups(Fig 1.6) talk about transferring dirty coffee stain into a material to make meaningful pattern. Lace Table(Fig 1.7) made by Marcel Wanders talks about transferring images of soft lace into strong and hard ones by gluing techniques. Cheap and ugly plastic bags could be a beautiful Vase(Fig 1.8) through a special idea and simple technique. Sponge for buildings or air conditioners could be all that is needed like the Zilla Bag(Fig 1.9).

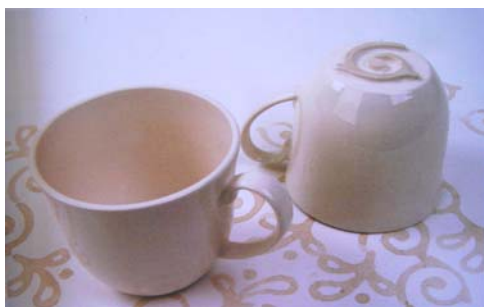
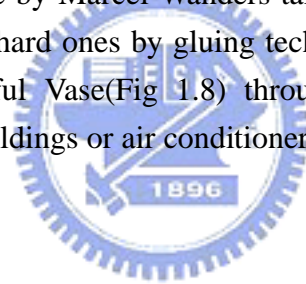


Fig 1.6 Stamp Cups



Fig 1.7 Lace Table, Marcel Wanders



Fig 1.8 Vase, D-Bros



Fig 1.9 Zilla bag, Sylvia Pichler

Experiencing and representing unrecognized material is a new idea

With reference to the book “Design of design” (Kenya Hara, 2005) “To see the normal things as unrecognized ones which can provide us different feel is a method of creating.” The ability which designers should be provided with is exploring the variety of material characteristics in design process. Discussing interesting points and any relationships between the material, technique and product can develop designers’ personal taste and style. Moreover, designers can break their way of thinking and learn new experiences from normal, overlooked or tiny things during this exploring process.

1.2 Motivation and objectives

Experiencing and representing unrecognized material is one of my interests. Looking at different combinations of paper, textile and plant texture through handmade prototypes will be the focus for this project. Furthermore, the influence of my thinking and a logical rule of this project will be defined after this exploring process.

In this project, paper will be the main material combined with textile concepts such as texture, structure, repeated pieces or technique to represent new texture of plant images. The objectives are as follow,

- (1) Realize and analyze the exploration process
- (2) Experience the depth of these two materials, paper and textile
- (3) Generalize a material base from a collection of work samples
- (4) Transfer texture or images of material samples into product design

1.3 Scope and outline of thesis

This project contains the discussion of material, technique, transformation in paper, textile and plant texture. Some subjects such as color and pattern will not be discussed in this material experiencing project. There are several chapters that will be provided for achieving this project process, including introduction, acknowledgement, methodology, result and discussion.

Chapter 1 Introduction

This chapter is going to introduce the background of my interest in material, and the description of project motivation, objectives, and scope.

Chapter 2 Paper, Textile and Plant Texture

This chapter begins from the observation of paper, textile and plant. Material characters will be determined and explained here. These characters may be the information needed when the material design is conducted later.

Chapter 3 Exploration

This chapter contains the exploration structure, information analysis, plant image transformation, productions and material application etc; in order to determine the representation of plant, paper and textile to create a new material.

Chapter 4 Material Collection

This section will demonstrate the result of the exploration. A number of material samples will be designed in this project and the detail description of every sample will be written down in this chapter..

Chapter 5 Application of Material Collection

For achieving the process of applying material collection to product design, here is a design process to demonstrate it.

Chapter 6 Discussion

After the exploration with research, analysis, producing and design process, this chapter is going to discuss the whole process and provide suggestion afterwards.

Chapter7 Exhibition

The exhibition of this project is recorded in this chapter. It contains the installation design, working process, the way of exhibiting material collection, product design and the light arrangement. .

Chapter 8 References

The list of references, including books, essays, and periodicals.



2. Paper, Textile and Plant Texture

This chapter begins from the observation of paper, textile and plant. Material characters will be determined and explained here. These characters may be the information needed when the material design is conducted later.

2.1 Paper

This section includes the information of paper and the characters of its usage. Apart from the background overview, the characters of the material's usage are the main part for determining the kinds of function which paper can provide. However, this information may become the basic knowledge for using paper in the design.

2.1.1 Background

Papermaking is considered to be one of the Four Great Inventions of Ancient China, since the Han Dynasty Chinese court official Cai Lun is widely regarded as to having invented the modern method of papermaking from wood pulp in AD105. Paper without writing has been used mostly for purposes of wrapping or padding protection of delicate objects. In general, paper is used for the recording of knowledge such as book, magazine and newspaper, the representation for value such as paper money and ticket, cleaning such as toilet paper and handkerchiefs, craft such as paper cut, paper umbrella and lantern. Its widely application has held an important position in history.

Apart from its practical function, paper art and paper craft have a long development in art history. In contemporary art, paper is not only a useful material but also a medium for artwork through every paper art technique such as paper statuary (Fig 2.1), paper cut (Fig 2.2), origami (Fig 2.3) or paper modeling (Fig 2.4). Paper art and craft are usually created for the representation of the artist/designer's self-awareness and personality. Artworks are created abstractly, others concretely; some are created for practical use, while others are decorative; some are created skillfully, others handmade freely. However, paper is a pure material which can be easily carry the artist/designer's concept to people through its unique and diverse characters.



Fig 2.1 Paper statuary



Fig 2.2 Paper cut



Fig 2.3 Origami



Fig 2.4 Paper modeling



2.1.2 Characters in Usage

Fibers are the main material in paper. Papermaking involves making a dilute suspension of fibers in water and allowing this suspension to drain through a screen such that a mat of randomly interwoven fibers is laid down. Water is removed from this mat of fibers by pressing and drying to make paper.

Paper is a popular material for design as a result of its highly transformable character. It is cheap, can be found everywhere, easily constructed such as cut, folded, torn, twisted, and also shaped anywhere with any simple tools and skills. People use it daily, from masters to kindergarten students. However, although paper works very well in our daily life, there are still lots of capabilities that can be innovated for various purposes.

Paper is not only a material but also a useful product. For example, paper provides a function for painting or writing when it is a product. If it is treated as a material

or medium like contemporary paper art, it can be an artwork and has its own personality. Paper also displays elegant technique and design through its character without any symbol or pattern. However, using the material itself to describe what it can be is a pure and easily achieved process.

Texture's feature which paper can present is various. For example, handmade paper has soft, tender and hairy texture; tracing paper's texture is neat, translucent and cold. Handmade paper made of bamboo fiber usually has thick and warm texture like snow. Its soft texture also makes people feel tranquil and peaceful when touching it. Furthermore, paper manufactured for printing or publishing has big differences with handmade paper, especially its thin, smooth texture and practical functions. Paper is used for different purposes according to its different features of texture.

Conflicted characters exist in paper. It is fragile but can be cut easily. It is usually kept away from water, but this easily-dissolved material is good to make a tissue. However, good characters sometimes are not good depends on different situations. If these characters can be used in right way, there will be vast potential in the application of paper.



2.2 Textile

This section contains observations about textile and texture characteristics. Apart from the background, it is biased toward texture constructions as they are easier to be achieved than other abstract concepts. Nevertheless, the information given here may be used in designing such as texture structure or layout whenever they occur.

2.2.1 Background

Textiles have heavy usages in our daily life; the most common usages are for clothing and containers such as bags and baskets. In the household, they are used in carpeting, furnishings, window shades, towels, covering for tables, beds, and other flat surfaces; they are also used in art. Other uses include flags, backpacks, tents, nets, balloon, etc. From functional products to delicate artwork, textile has been an important material and medium for carrying our culture information, elements and life style since early civilization.

Despite how common it is in our life, textile work is an important craft in art as well. Artists or fashion designers create their crazy ideas and try to provoke deep

thought inside their mind through using textile combining different techniques such as weaving, knitting, sewing or quilting. Furthermore, some textile artworks are represented in modeling, and others are done in making texture. It goes without saying; textile is a useful material or media for to easily express your concepts into visual objects.

2.2.2 Characters in Texture

In terms of observations of textile texture, its construction characters can be separated into several parts including structure, arrangement, materials and expression forms.

Textile structure is the essential part providing connective function in texture construction. It is composed of techniques like weaving (Fig 2.5), knitting (Fig 2.6), crocheting (Fig 2.7), sewing (Fig 2.8) or quilting (Fig 2.9) which is given different texture features. Nevertheless, textile structure can not only be the connection with strings but it is also a kind of texture.



Fig 2.5 Weaving



Fig 2.6 Knitting



Fig 2.7 Crocheting



Fig 2.8 Sewing



Fig 2.9 Quilting

Arrangement or layout in textile design may cause new textures. Most textile artworks are connected with many tiny duplicate pieces. These small pieces always demonstrate a creative arrangement in textile artworks. Like the textile artist Patricia Campbell, she is interested in the beauty of repetition and always connects simple shape elements to create her artwork with her imagination (Fig 2.10). However, arranging elements which causes various effects in textile design is the representation of personal awareness.



Fig 2.10 Patricia Campbell

Different materials may provide different features in textile texture. For example, natural fibers like bamboo or vine give us friendly texture; and artificial fibers such as wire or plastic, they give us a modern style. Therefore, materials sometimes play the role of recognizing texture identity.

Subject for textile making is always the first attraction to people. Most subjects used for designing textile are about nature such as flowers, plants, forests or sea. They are usually created in the aim of depicting true shapes, such as flower and plant forms; or represented in abstract description. An example is the Swedish textile and graphic designer Hanna Werning, her work is always inspired from plants with colorful pattern printing (Fig 2.11). Of course, this natural subject is also made in other textile techniques which cause strong texture identities in textile artworks.



Fig 2.11 Textile collection by Hanna Werning

2.3 Plant and Texture

Plant like grass or flower blossom, is a kind of textile covering the earth all around the world. Every plant has an individual figure with different shapes of leaf, petal and root; even growth structure which provides various texture when gathering together.

2.3.1 Plant Growth and Arrangement

Plant growth and arrangement can cause texture, like cherry blossoms covering a tree may be a pink carpet-like textile composed with many tiny petals (Figure 2.12). Different from the composition of many tiny elements, plant details provide another texture such as veins spreading in leaves (Figure 2.13). Nevertheless, the detailed observation of a plant should not be overlooked as there is much information that can be found when designing texture.

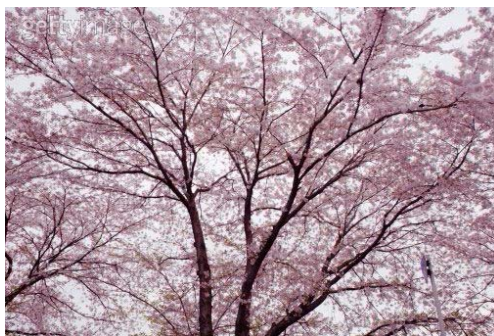


Fig.2-12 Cherry Blossom



Fig.2-13 Leaf vein

2.3.2 Plant in Design

Inspired from nature, artists/designers start to create something similar to plants by different artificial materials combined with their own awareness. For example, Jan Stark created a set of paper sculpture describing flowers and grass (Fig 2.14); Domingos Tótoro designed a collection of Kraft container describing plain texture (Fig 2.15); Christine and Margaret Wertheim's 'Hyperbolic coral'(Fig 2.16), a collective celebration of colorful creatures is taking form in an amazing crochet project that aims to raise awareness about the threats to delicate ocean ecosystems. In addition, ceramics (Fig 2.17) or plastic (Fig 2.18) has been used for describing plant texture as well. Plant representation has much potential in all kinds of material.



Fig 2.14 Paper Statue



Fig 2.15 Kraft Container



Fig 2.16 Hyperbolic coral

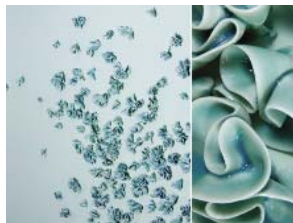


Fig 2.17 Ceramics



Fig 2.18 Plastic

The foregoing should help us when working upon plant texture design subject. While this project is a collection of material samples of plant texture made of paper combine textile techniques. What all this material design has is not only a demonstration of skill, but also the imagination of plant figure and growth. Furthermore, they talk about the story of materials including the relationship between imagination and production.

3. Exploration

This chapter contains the exploration structure, information analysis, plant image transformation, productions and material application etc. in order to achieve the representation of plant, paper and textile to create new material. For this purpose, there is an experimental process to explore the variety of materials and develop a material collection for usage in any other design. In this project, there will be a demonstration of applying product design process on the material collection. In order to achieve the whole process in this project, the exploration structure as follow will explain it step by step. (Table 3.1)

(Table 3.1) Exploration Structure Table

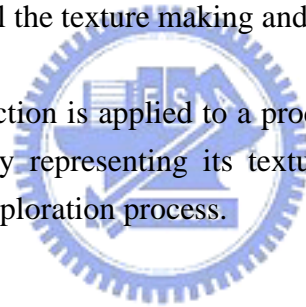
Steps	Formation
1. the Information of Paper ,Textile and Plant	
↓	
2. Organize the Information	→ Character Analysis
↓	
3. Decide Experiment Concept and Brief	→ Experiment Concept
↓	
4. Pre-experiment	→ Pre-experiment Samples
↓	
5. Analyze Pre-experiment	
↓	
6. Create New Exploration Directions	→ Exploration Directions (matrix)
↓	
7. Produce and Record Process	→ Samples
↓	
8. Analyze all samples	→ Material Collection
↓	
9. Apply Material Collection to Product Design	→ Product Design
↓	
10. Discussion :	
Critic the Whole Experiment Process	
Exhibition	

3.1 Exploration Structure

First of all, in order to figure out clearer exploration concept, the first and second steps are by starting the research and analysis of paper and textile overview including culture background, materials, techniques, texture images and artworks. Step 3, this organized information becomes a new subject - Plant Texture, the representation of paper and textile craft.

Step 4, according to the concept, the pre-experiment takes place by creating some texture samples through the usage of paper and textile materials to sketch images from plant imagination. This step is repeated around 3 times to get enough samples. Step 5, these samples are separated into several parts according to their texture images. Then step 6, these separated parts is given new definition from the relationship of plant figures and textile techniques. The new definition is organized into a matrix as further exploration directions. Step 7 continues to make texture samples to finish the emptiness of the matrix. After that, step 8 becomes a material collection after all the texture making and analysis.

Step 9, this material collection is applied to a product design, glass sleeve, which is a proper product nicely representing its texture. Step 10, finally comes the discussion of the whole exploration process.



3.2 Character Analysis and Pre-experiment

This section contains character analysis of paper, textile and plant, and the pre-experiment of creating materials by using these characters.

3.2.1 Character Analysis

According to the foregoing observation, some characters of the relationship between paper, textile and plant have been discovered for texture representation. On the one hand, for representing plant texture with paper in textile way, textile construction is the most important consideration in developing ideas. Its structure and arrangement may decide the identity of every texture design. For example, weave is not only a skill that provides the structure when making fabrics but causes a strong impression in texture; while the beauty of repetition talks about arrangements in textile design. On the other hand, plant image transformation will be the representation subject. For example, a leaf shadow under the sun is about a natural phenomenon, veins climbing up the tree are a kind of growing structure, or

the petal shape is a plant's appearance. However, the subject influences the usage of material and technique, even the structure and arrangement when designing.

Depending on the analysis, this project experiment starts from three classified plant image characters, growth structure, nature phenomenon, and plant appearance. Growth structure means the patterns of plant growth, such as branch systems, leaf arrangement or inflorescence. Nature phenomenon is the effect of plant combining other things such as sunshine, water, or some destruction such as scar or scratch. Plant appearance is about the shape or form of plants such as petal shape and leaf margin. Three examples are shown in Fig 3.1. Plant texture representation will be designed by using these images with paper and textile techniques.

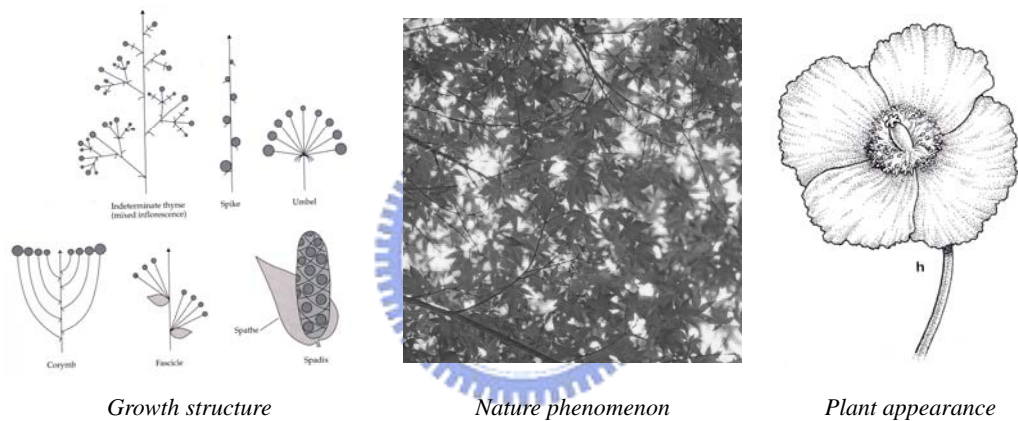


Fig 3.1 Plant image characters

3.2.2 Pre-experiment

In the very beginning, through the inspiration of plant images, most of the samples are made displaying plant features roughly and freely. The purpose of pre-experiment is widely exploring idea concepts of texture imagination. On the other hand, being familiar with materials and techniques in this step aims to express the imagination from the brain more easily.

The pre-experiment samples are shown in Fig 3.2.

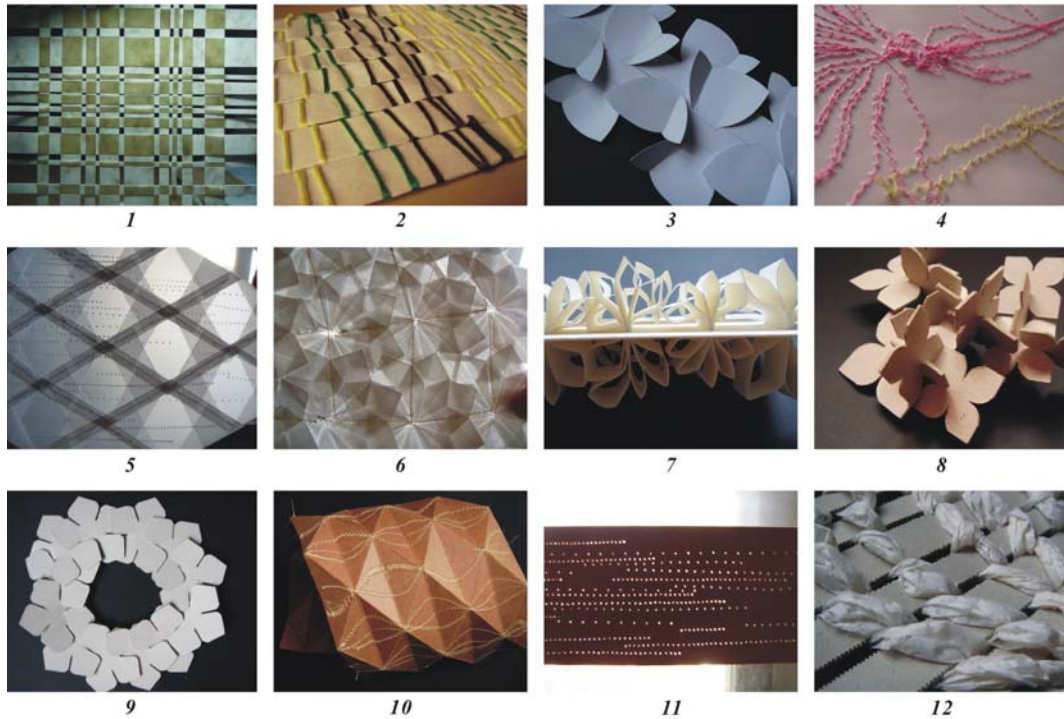


Fig 3.2 Pre-experiment samples

3.3 Exploration Directions

Exploration directions have been created for the purposes of understanding more about textile construction and exploring more idea concepts. Apart from that, they will help to develop a collection of materials.

3.3.1 New Definition of Textile Techniques

Samples are classified according to textile techniques. There are 12 different techniques namely: weave, insert, sew, pile, squash, string, bind, twist, penetrate, button, roll and fold. These techniques are given new definition by transforming original ones into an imagination of plant texture such as leaf shadow under sunshine, group flower petals or branch structure. The relationship of textile techniques and plant texture becomes a new direction of further experiment. The description of technique definition and photo overview is as follow: (Figure 3.3~3.4)

Weave

Weave means forming something by passing lengths or strands of material over and under one another. Its construction brings the image of plant growth rhythm with regular pattern.

Insert

Insert is to put something inside something else, or to add something. Structural arrangement is going to be function or pattern in design.

Sew

Sew is a technique of joining two pieces of cloth together by putting thread through them with a needle. Its texture is something like parasite stuck on a surface. Furthermore, it feels like leaf scars or imprints.

Pile

Forming a pile with many elements makes something rich and thick. It represents gradation like leaf shadows under sunshine or piles of book pages.

Squash

Squash means pushing a thing into a small space. There is some phenomenon in plant growth like this technique, such as a flower bud starting to development and grass growing up from ground.

String

String is a way of putting something through a number of objects. This method is related to plant structure such as leaves aligning along a stalk.



Fig 3.3 Technique description 1

Bind

Bind is to tie something tightly or to fasten. It shows the feature such as veins creeping onto trees and binding it tight to breathe.

Twist

Twist is a technique of turning something, especially repeatedly, or to turn or wrap one thing around another. It is also related to the image of tree growing up towards the sky.

Penetrate

Penetrate means something moves into or through others. It is like an action of destroying objects, making corrosion, or causing scratches.

Button

Button talks about fastening something, usually a piece of clothing, using buttons. This technique contains the relationship between pieces such as flower petals joining together.

Roll

Roll is turning over onto itself to form a cylinder or a sphere. The layers of the round side become the kinds of texture such as a rolling tobacco leaf. Furthermore, it may be the new idea of creating layer forms.

Fold

Fold is a skill of bending something, especially paper or cloth, so that one part of it lies on the other part. It is a skill used for forming everything with many layers and related to transformation of rose or mushroom structure.



Fig 3.4 Technique description 2

3.3.2 Unit Shape

The structure of ready samples is composed of tiny units which are dot, line and surface in shape. (Fig 3.5) Unit shape will be the identity of every sample texture. Therefore, it will be used for new texture making as well.

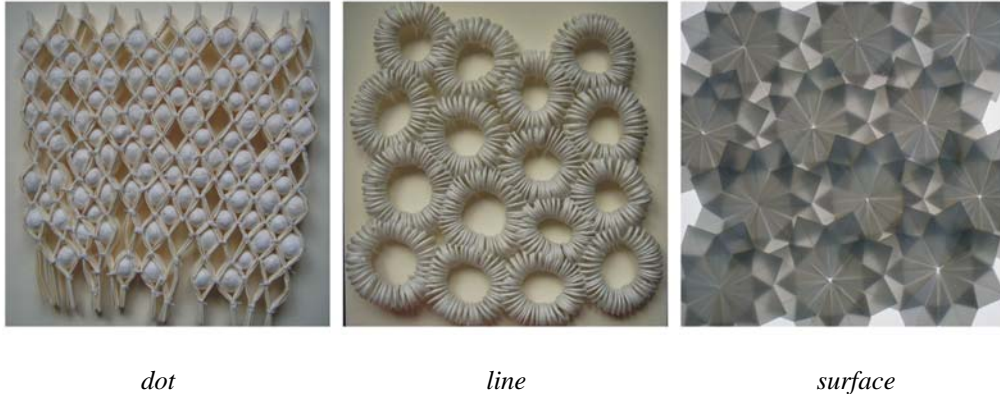


Fig 3.5 Unit shape



3.3.3 Restriction

In order to display texture in the sense of touch rather than the sense of vision, colors will not be used in this exploration. Different tones of white paper will be the material for the design. Every design concept will be done by a main technique combined with other minor ones.

3.3.4 Further Exploration

For this exploration, the way of exploring imagination is reorganizing these techniques and unit shape to create a matrix (Fig 3.6). Ideas can be explored gradually by filling in the empty space of this matrix. Therefore, when it is completed, there will be a new collection of 36 material samples. (refer to chapter 4)

• 12 Techniques

	Weave	Insert	Sew	Pile	Squash	String	Bind	Twist	Penetrate	Button	Roll	Fold
Dot												
Line												
Surface												

• Unit Shapes

Fig 3.6 matrix

3.4 Formation



3.4.1 Formation Recording

In order to achieve the details of thinking up a concept, making process, every new idea during producing, and the variation of imagination in mind; the exploration process will be written down in text and photography. Every sample will be recorded separately and has one individual page with one final photo, original concept, materials, creation process, and texture critics. Fig. 3.7 shows one recording example only, while others will be shown in the next chapter.



Fig 3.7 Production Recording Table

3.4.2 Material Collection

After finishing all the final samples, they will be collected as a material collection of plant texture made through the “paper combining textile techniques”. The collection can be further used by any design. Here is the overview of Material Collection (Fig 3.8).



Fig 3.8 Material Collection

3.5 Material Collection in Product Design

3.5.1 Product Texture Design

Material Collection has comprehensive application, especially the representation in product texture. From texture to structure, from big to tiny element or from solid unit to flat pattern, it provides much potential in any design situation.

Moreover, every texture sample combines not only paper but different materials to become other effects with its own personality.

3.5.2 Capability of Application

(1) Combination of Texture and Material

Different material has different characters which causes unusual dialogue between texture, material and technique combined with imagination, such as a rubber bend or electric wire in weave. (Fig 3.9)



Fig 3.9 Paper and rubber woven

(2) Shadow Representation of Texture

Light and shadow has more gradation in some texture, especially with pile and fold technique. These materials can be applied to any product with light effects such as lampshade, umbrella, or glass. (Fig 3.10)

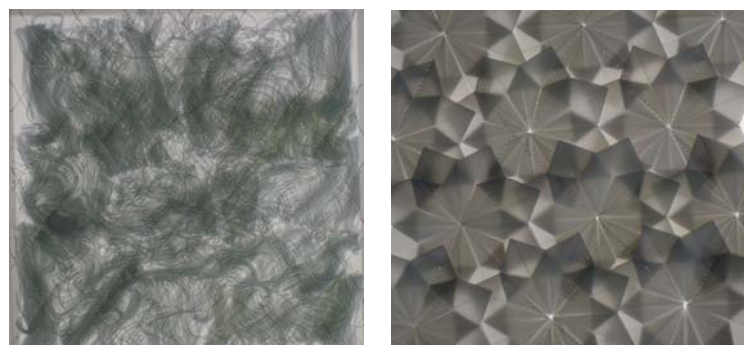


Fig 3.10 Texture with shadow

(3) Structure of Texture

Material texture sometimes involves its functional structure depending on specific techniques. Furthermore, the construction can be treated as a pattern in designing the surface of objects. (Fig 3.11)



Fig 3.11 Structure and its pattern

(4) Identity of Texture

The texture of every material sample has individual feature and characteristic demonstrating both external and internal identity. For example, weave-line texture's (Fig 3.12) external identity is soft, flexible and light. On the other hand, its internal identity is feminine and tender because of its feminine technique and thin paper material. However, identity of texture can be used for some conceptual idea as if displaying product personality.



Fig 3.12 Feminine texture

(5) Practical Function of Texture Element

Some elements in texture have practical function such as button-surface texture. Every unit can be enlarged to be a single object with beautiful form and other details. Furthermore, it can also be shrunk and gathered together to show the majority of its beauty. (Fig 3.13)



Fig 3.13 Button-surface texture



The foregoing experiment structure should help plant texture designs when created upon this subject. From material observation to completed material collection; and also to its application, this process gives us a new system to explore more ideas. In this project, there is a material collection with 36 samples and a set of product design that will be made afterward. The results with detail description and recording are shown in the next chapter.

4. Material Collection

There are 36 material samples completed in this project and every one has its own concept and characters. Material Collection is shown in chapter 3, figure 3.8, while the detail description of every sample has been written down in the following page. (Table 4.1~Table 4.48)

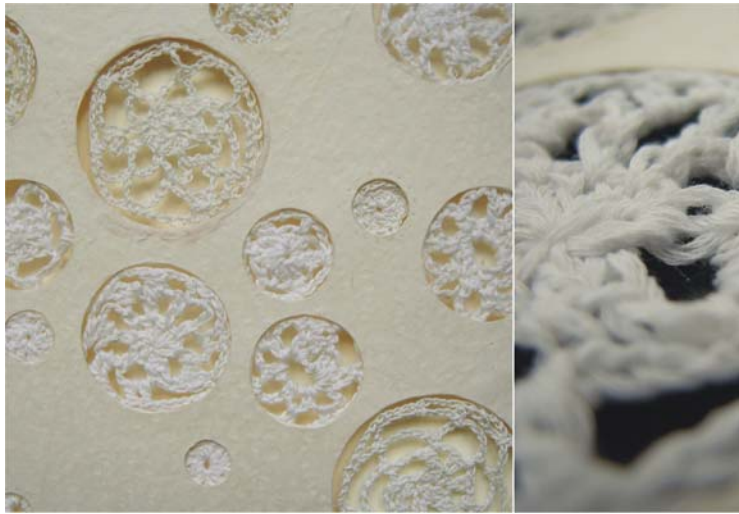


Weave



Weave means forming something by passing lengths or strands of material over and under one another. Its construction brings the image of plant growth rhythm with regular pattern. Like the pattern of overlapping palm's leaves, or vine creeping on a frame. These plants have regular structure with crossing leaves or stems providing undulate texture and shadow between them. Furthermore, their shadow projected on the ground presents ordered pattern with gradational colors of gray.

Table 4.2 Twinkling Bubbles, Weave-Dot



Twinkling Bubbles

Weave – Dot

Paper card, cotton thread

25x25cm



Original Concept Inspired from lotus root slices floating on the water, there is a beautiful imagery created from these round frames.

Description This sample is created by paper card and lace. These two materials combine together displaying contract texture like soft and hard tactile feelings, simple and complex structure, and energetic layout with jumping bubbles. Furthermore, the image of this texture is tender and feminine like a shy lady hiding behind a wall.

The material is made of shade and hollow parts. It may be a proper material for making curtain, shield or door screen design, particularly its lace shadow provides a pretty pattern under sunshine.



1. crocheted lace pieces



2. make paper board with many holes

3. stick lace pieces to the board

Table 4.3 Vineyard, Weave-Line



Vineyard

Weave – Line

Paper

25x25cm



Original Concept The idea comes from the vitality of growing vein and grapes entwining around the supporting parts.

Description The material is made of twisted paper in changeable knit. After knitting, twisted paper can be adjusted so some parts become a fluffy texture. Loose and compact structure causes the natural vitality layout. Its texture is soft, flexible and fragile with a warm and tender image.

This kind of paper is usually used for making lantern which is thin, soft, wrinkled and easy to be glued together. The knitted material with thin paper has misty texture under light and can be applied to lamp shade design.

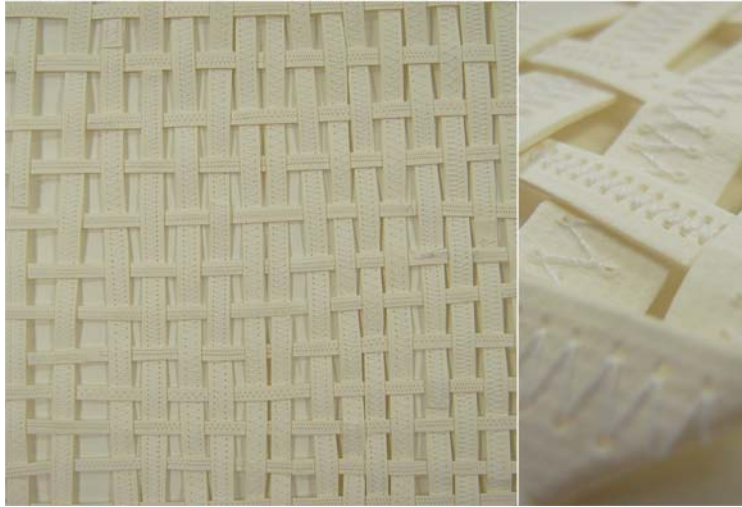


1. twist long, thin and soft pieces of paper out of threads



2. knit a textile with these threads

Table 4.4 Nest, Weave-Surface



Nest

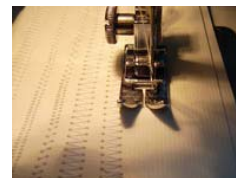
Weave – Surface
Paper, cotton thread
25x25cm



Original Concept The imagination is from a hedge with biting branches.

Description It is made of decorated paper in loose weaves. Weaving layout represents the neat hedge and the decorated threads on paper causes biting feeling texture and inflexible structure. Apart from the construction, the image of biting thread texture looks like that something wants to break out from the rules.

Adding something onto the other segmented sketches to change the original texture may increase rich tactile feelings. This is different from the original one, decorated material provides not only another identity but also strength, like paper slices with threads are stronger than what it was. Nevertheless, this concept can be used for a more diverse design such as something that needs both decoration and structure.



1. sew threads on pieces of paper



2. weave pieces of paper to become a surface

Insert



Insert is to put something inside something else, or to add something. Structural arrangement is going to be function or pattern in this material design. Refer to plant texture, dandelion has the similar growth structure with seeds. Its seeds' array looks like something is inserted in somewhere. This arrangement causes beautiful and clear architectural pattern with many small elements. However, duplicated elements and their connective methods play an important role of this construction.

Table 4.6 Honeycomb, Insert-Dot



Honeycomb

Insert – Dot

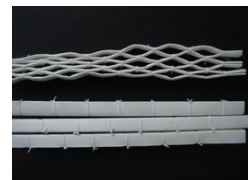
Paper, cotton thread, paper balls
25x25cm

Original Concept Pods inserted with seeds are connected together.



Description This material has strong a structure, hardly bent and complex textile arrangement like a honeycomb. Its texture has many tactile feelings such as different thickness, materials, shape, and hardness because of different materials and item shapes it gives us. Furthermore, the image of the texture is complicated and inflexible like its stubborn personality.

The material structure has neat, clear and tight architectural pattern with changeable arrangement. For further use, this texture construction can be the concept for making iron gate or birdcage in proper materials like iron, steel or bamboo.

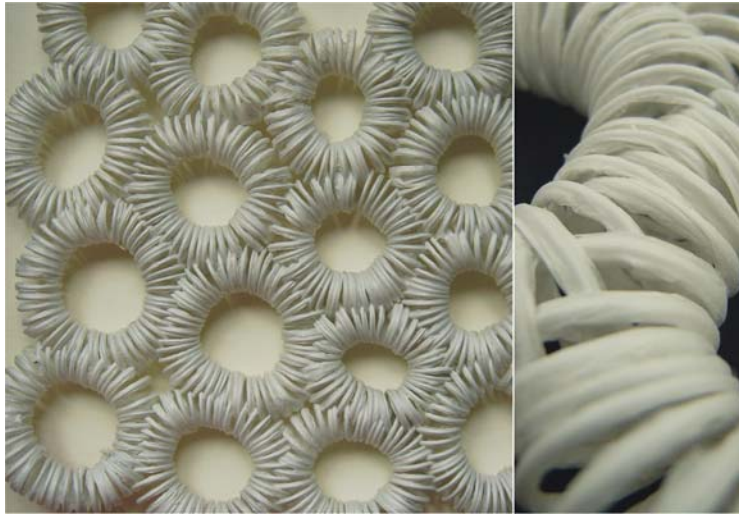


1. fold a piece of paper and fix it with glue as a thick strip
2. bind these strips gap by gap with thread to make a honeycomb structure



3. put paper balls inside every holes

Table 4.7 Squeezed Blossom, Insert-Line



Squeezed Blossom

Insert – Line

Paper, wire

25x25cm



Original Concept Curled grapevine inserts with each other.

Description This material is produced with curled wire items covered with thin paper sheets. Representing contrasting images such as soft and hard, warm and cold images. These items made by cold wire are shaped round and arranged like blossom pattern. Furthermore, tension provides the connection of every two items. Curled wire causes this material structure elastic and unstable like a jumping object. In addition, the textile layout arranged with repeating wire rings looks like squeezed blossom with embroidery needle details. Wire rings merged with each other between every item becomes a three-dimensional effect of needle work.

Unlike the usual connection of gluing technique, the tension between these wire rings is a structural beauty. This connection can be both a technique or pattern for designing tiny jewelry piece or huge iron fence to display the structural strength.



1. wire covered with paper rolls like a spring and coils as a ring.



2. connect rings by the bounce of wire.

Table 4.8 Grove, Insert-Surface



Grove

Insert – Surface

Paper card

25x25cm



Original Concept Leaves gathering like groves.

Description Irregularly connected leaf pieces become three-dimensional textile. Textile sometimes is made by many small components joined together, some artworks are flat and some are not. The material feature comes from this idea to describe grove image by many leaves connecting with themselves without any joint. In addition, leaf shape and connective track affect the structure, arrangement and appearance of whole material piece even though with freely composition.

This grove liked material may be used for installation design representing nature scenery with a good deal of tiny pieces like leaves or flower petals. For displaying spreading landscape, small items can be mass produced and joined together to make large a artwork decoration.



1. Make leaf pieces with connective tracks
2. Connect these pieces one by one with the tension of paper card

Sew



Sew is a technique of joining two pieces of cloth together by putting thread through them with a needle or sewing machine. Its texture is something like scars stuck on a fabric with thin and elegant threads sewn tightly.



However, related to nature phenomenon, it looks like scars or imprints spreading on leaf surface. Both of them are destructive enough to make a leaf dry or die. The ruined surface feels rough and pierce.

Table 4.10 Tattoo, Sew-Dot



Tattoo

Sew – Dot
Paper card
25x25cm



Original Concept The texture imagination of spores sticking tightly behind the leaf

Description Material pattern is depicted by sewing machine without any threads. The paper card surface has been undulated to become texture through this way. Because of the broken outlines, this imperfect pattern provides viewers more imagination of the whole layout. Moreover, using sewing machine without threads is a new way of doing colorless but textured sketch.

This material has a wide application in graphic design. Unlike the usual flat graphic design, this technique gives designers a new way of drawing pattern on paper by using sewing machine instead of pens. Such as handmade postcard, business card or poster, the skill gives viewers not only visual graphics but also tactual feelings with strong impressions. Adding the feeling of touch on graphic may provoke deep memory form people's experience as well.



1. Sew pattern along sketch lines on paper card without thread

Table 4.11 Parasite, Sew-Line



Parasite

Sew – Line

Tracing paper, cotton thread

25x25cm



Original Concept the impression of wounded leaf, as if something grows and sucks up moisture from it

Description Representing the impression of weak texture, this material is made by tracing paper with sewn pattern. Pattern made with biting texture by sewing freely on kneaded tracing paper looks like scars stuck on leaves. Because of the tracing paper, the texture feels cold, dry and fragile.

Changing useless or secondhand material to become useful again is a kind of eco-awareness. Like this material, ruin paper sheet can be redesigned by texturing something on it to change its texture and surface appearance. Thus, this paper sheet will be another material with new identity and feature for further usage.



1. sew something like callus irregularly on a pile of kneaded tracing paper.

Table 4.12 Specimen, Sew-Surface



Specimen

Sew – Surface
Paper, cotton thread
25x25cm



Original Concept The imagination of preserved beautiful leaves

Description Lumpy paper statuary has a new feature when it is connected with textile technique. Paper provides element shapes and textile does connection with every items. Thus, the texture not only looks like a piece of paper but also fabrics. Like this material, withered leaf shape and texture are depicted by paper statuary. Then, in order to preserve the beauty of dry leaves, they are designed by sewing them piece by piece together to become a textile. Sewing pattern is also like leaf margins, thus, it has various thickness feature.

The combination of paper and sewing technique develops another new material with new texture. This texture only has a little bit heave and can be treated as a new surface which can carry information, drawing or print.



1. make withered leaves by paper statuary skill

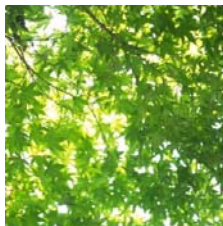


2. connect leaves along the edge by sewing machine

Pile



Forming a pile with many elements makes something rich and thick. These elements are usually repeated to set up a pile straightly or gradationally. This skill causes rich texture on the side with many layers.



The scenery of leaf shadows under sunshine has the gradation presenting this pile texture. Leaves gathering thickly or thinly can express the texture with natural layout. Nevertheless, this skill can make specialized features like layers and shadows, depends on design arrangement.

Table 4.14 Cocoon, Pile-Dot



Cocoon

Pile – Dot
Tissue
25x25cm



Original Concept The structure of cob and preserved corn is like dots stacking together.

Description These elliptic items are made by shaping wet tissue in different sizes for depicting corn figures. After wet tissue dried, corn items have dry and ragged skin which is like preserved food. The arrangement of the texture looks heavy despite the light tissue. Its texture also has dry, tight and rough in touch. In addition, the finished material has cocoon image in its shape and color.

Tissue used for this material has been treated as a new stuff. Different from daily supply, it has another usage for shaping models with water instead of any glue. This idea coming from old papermaking technique might be applied to other designs.

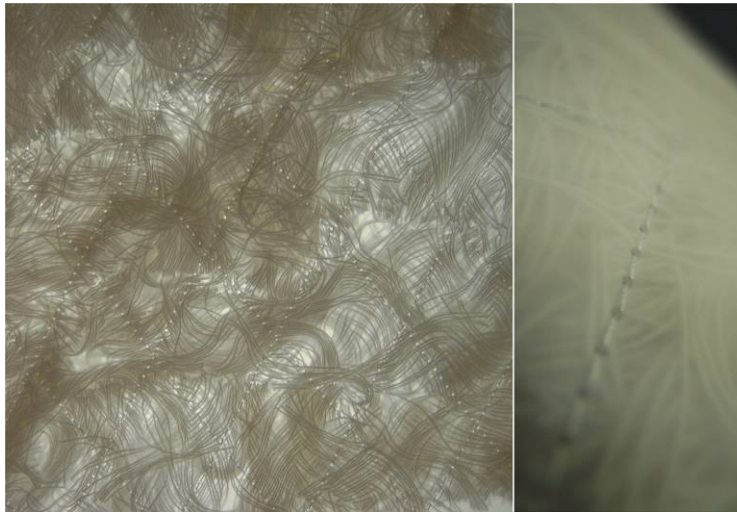


1. put tissues into water to make them softer and easily shaped



2. shape these humid tissues, let them dried and stick them together

Table 4.15 Mixing Cloud, Pile-Line



Mixing Cloud

Pile – Line

Tracing paper, cotton thread
25x25cm



Original Concept Fallen stamens are collected into a pack.

Description The idea comes from protecting fallen stamens. For this purpose, hard tracing paper is used for the package design and soft threads are used for depicting steams. In this finished material, the texture made of threads kept inside tracing paper with sewing pattern has an image of mixing something. The layout comes from the textile grid pattern to display a new fabric figure. Fixing moving things inside a pack looks like something with high energy flowing in a narrow space.

This material made of paper and fabric with textile technique is also a new combination which can be other stuff for design. In addition, with its translucent and mixing texture, this material also provides viewers a visual imagination of blurry clouds under sunshine. Thus, it may be properly used for lampshade, table or decoration design.

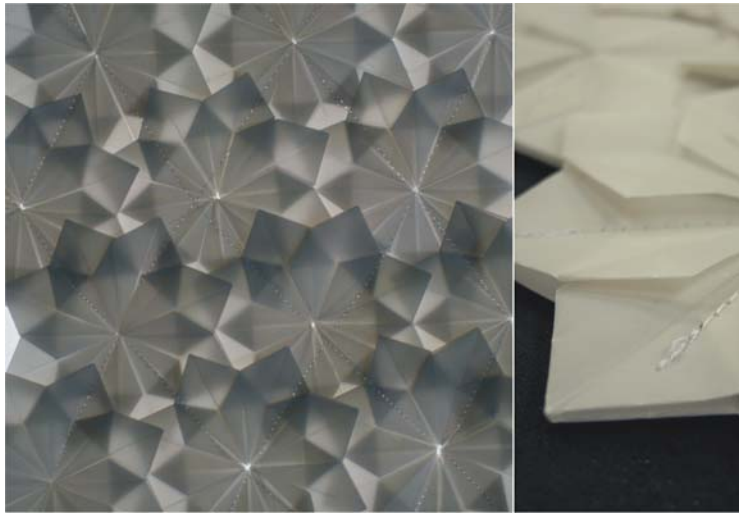


1. put lots of thread inside a tracing paper envelope



2. close the envelope by sewing textile pattern on it

Table 4.16 Foggy Shadow, Pile-Surface



Foggy Shadow

Pile – Surface

Tracing paper, cotton thread
25x25cm



Original Concept The appearance of leaves covering with each other under sunshine

Description In order to depict leaves under sunshine, the textile covering with many translucent leaves is created by origami and tracing paper. However, origami provides geometric pattern and its shadow can be displayed well under light to become foggy shadow texture. Geometric leaves show the characteristics of origami art and differences between nature and craftsmanship. Furthermore, the beauty of this texture depends on the paper and the amount of items which is the more the better.

Obviously, this material relies on light to display its texture. It has wonderful shadow with different tones of gray under light. If this material is made by a good deal of small items, it will become a great textile installation and decoration. Besides, it may be used for certain, window or even furniture design.



1. Fold up pieces of tracing paper and make leaf shaped items.
2. Assemble each leaf component by sewing technique to make a paper textile.

Table 4.17 Squash

Squash



Squash means pushing a thing out or into a small space. There is some phenomenon in plant growth like this technique, such as a flower bud starting to develop and grass growing up from the ground. This natural composition provides two kinds of texture, one is fresh, soft like grass, and the other is old and hard like the ground. This technique makes the texture rich and presents energetic strength of growing plants.



Table 4.18 Floating Duckweed, Squash-Dot



Floating Duckweed

Squash – Dot

Paper

25x25cm



Original Concept duckweed with squashed leaves

Description Inspired from duckweed floating on the water, these small items made of thin paper display light leaves and their crowded texture when gathered. Every leaf shape depicted from duckweed is round and has a squashed bulge in the middle. The arrangement of this texture comes from natural duckweed overlap freely one by one. It also represents the beauty of mass repetition.



1. use a piece of round paper to make a corn, squash the peak of the corn, and stick these small items together

Table 4.19 Growing Grass, Squash-Line



Growing Grass

Squash – Line

Paper card, cotton thread

25x25cm



Original Concept grass breaks soil and grow up

Description For expressing grass growing up from the ground, this material has been made by threads and paper card with the layout of some hairy and flat parts. The hairy parts exhibit growing grass and the paper card covered with rough texture expresses ground. Furthermore, the arrangement is designed by textile making rules to display the repeating texture. This material shows the variety of texture and sometimes gives people the imagination of rich nutrition.



1. use short thread and several pieces of coarse paper card and stick them together

Table 4.20 Bloom, Squash-Surface



Bloom

Squash – Surface

Paper

25x25cm



Original Concept The imagination of flower blossom squashing together

Description Inspired from flower pedals squashing to blossom, a pile of shaped paper sheets explodes from the edge to become blossom texture through sewing skill. Simplified flower petal shapes aligned tidily exhibit exploding blossom items. Then, these items are connected to create a repeating textile arrangement. Because of the tension of sewing technique, these paper blossoms have various forms with the image of plant growing energy.

This material has exploding texture from itself. The extra parts provide other features than the original flat material. These parts can be formed in any shapes to display various textures identities. Particularly with other material like soft felt, it can be designed for pillow or carpet by using this material texture.

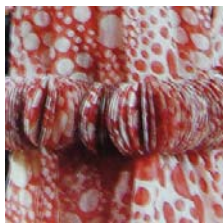


1. make piles of paper sheets



2. sew them together one by one

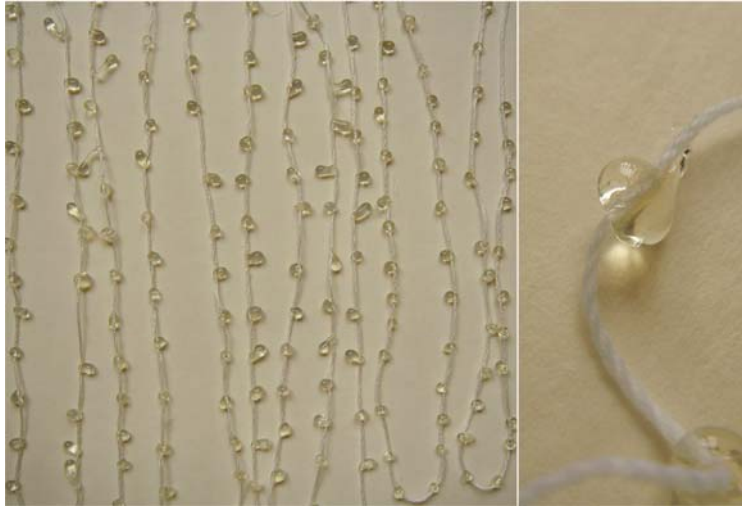
String



String is a way of putting something through a number of objects. This method is related to a plant structure such as leaves aligning along a stalk. Some groups of plant with a string figure like Canterbury bell have crowded texture when grown together. The texture with many small repeated flowers has beautiful and regular growth pattern. Its touch is thick and rich and have the impression of vitality.



Table 4.22 Dawn Dew, String-Dot



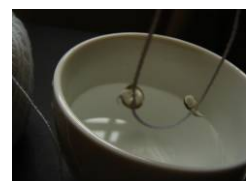
Dawn Dew

String – Dot
Cotton thread, glue
25x25cm



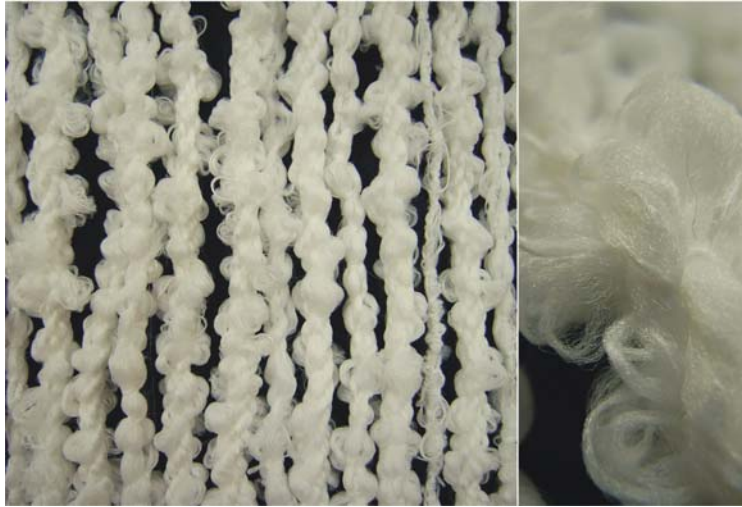
Original Concept Transformation of drops hanging up on the stalk at dawn

Description Drops hanging up one by one on the stalk look like a crystal string. In order to describe this imagination, transparent glue is used for making drops and stuck on thread. These drops are made by glue gun which can shape hot and thick glue liquid. This material texture looks light, cool and fragile and needs more protection. Furthermore, these strings can be organized in different layout to display texture figures. Like this material, its layout is made to be a natural arrangement of stalks with beads of dew.



1. Use glue gun to stick drop shaped glue beads along cotton threads and put them into water to cool down. There will be many transparent drops stuck on threads.

Table 4.23 Exploding Bud, String-Line



Exploding Buds

String – Line

Rope

25x25cm



Original Concept The shape of exploding buds on branches

Description This material is made by ropes. A rope is made of many thin strings which can be dragged out from the body of the rope. After dragging out the threads, the rope shape has been changed like exploding buds on the branch. Only rope can be made into this with extra parts spreading from it. Thus, its texture touches soft, hairy, flexible and a little pierce. In addition, it gives viewers complicated and dizzy feelings when string items are aligned to be a textile piece.



1. drag thread from a thick string to make single items, and align them into a surface

Table 4.24 Flower Necklace, String-Surface



Flower Necklace

String – Surface

Tracing paper, cotton paper

25x25cm



Original Concept Collections of flower petals

Description In order to depict the texture of flower petals, stringing provides a way to connect them with each other. After stringing paper petals tightly, here comes a texture with many layers. The texture of these squeezed paper petals shows the beauty of irregular composition. Several tones of white make it alive as well. Furthermore, this material tells us the beautiful strength of aggregation.

Mass repetition develops pretty composition in this material concept. Then, this concept can be applied to any design like jewelry design with metal, plastic, felt or paper. The shape of every item and the string structure can be designed for different final appearance.



1. Cut many round pieces from paper



2. Connect them by a string going through

Table 4.25 Bind

Bind



Bind is to tie something tightly or to fasten. It is also a technique for creating texture with structure and its pattern. Then, the texture made through binding has some features like regular repetition, roughness and thickness, depending on different materials. It shows the natural phenomenon such as veins creeping onto trees and binding it tightly to breathe. With different plants, it has different texture, tight and hard, curled and straight.

Table 4.26 Cells, Bind-Dot



Cells

Bind – Dot

Paper card, cotton sticks

25x25cm



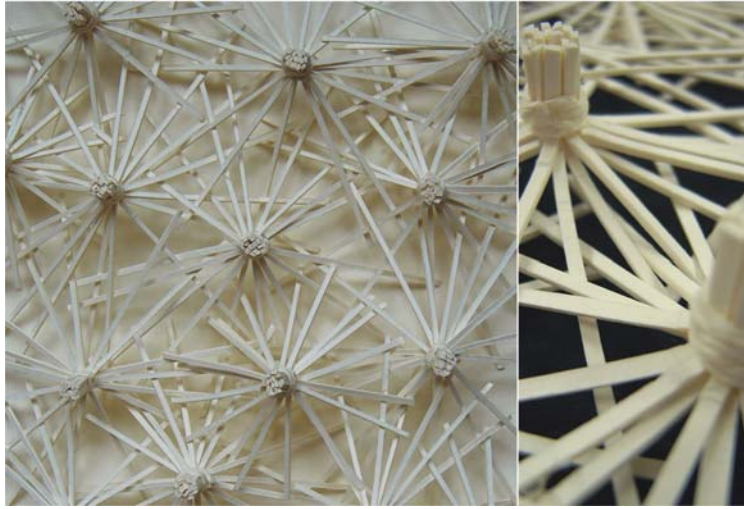
Original Concept Have a bird's eye view of bundles of mushroom

Description Group arrangement is a characteristic of textile. Below this rule, this material is made by tiny cotton sticks bound together to express a bird's eye view of mushroom bundles. As we can see, the arrangement including small and big sizes also describes the various aggregation of textile. In addition, its texture looks tight and touches heavy, soft and thick.



1. Make a paper ring to bind a bundle of cotton sticks.
2. Stick these items to make a flat surface.

Table 4.27 Vein, Bind-Line



Vein

Bind – Line
Paper sticks
25x25cm



Original Concept the structure of lotus vein

Description In this material, paper sticks are bound to be a vein structural item. Then, many items are joined to display the repeating textile arrangement. Apart from the material arrangement, bound lines develop vein pattern and shadow spreading out from every middle part. These bound lines show an architectural pattern whenever connecting together. This texture looks light, thin and weak like real leaf vein. However, this texture has an oriental layout and style because of these item shapes. It is probably related to the structure and shape of oil paper umbrella. Thus, it provides viewers the oriental impression.



1. Group and bind several paper sticks from one site, and open these lines like an umbrella from the other site

Table 4.28 Creeping Vine, Bind-Surface



Creeping Vine

Bind – Surface

Paper, ribbon

25x25cm



Original Concept Soft vine clasps a thick stem tightly to show the strength and vitality of soft plants

Description To represent this concept, paper with rough texture and silk ribbon are used for making this material. Shaped paper like stems are bound together by ribbons. Both conflicting characters, roughness and delicacy, has been used in this texture design to represent these two plant species. However, there must be different tactile and visual feelings with lumpy paper and shiny ribbon. The strength of binding technique causes a loose or tight structure. Nevertheless, reflection of ribbon is also the imagination of healthy vine. Contrary to that, rough paper represents weak stems.



1. bind these stem-liked paper with shining ribbon by binding technique

Twist



Twist is a technique of turning something, especially repeatedly, or to turn or wrap one thing around another. It is also related to the image of an old tree growing up towards the sky. Twisted stem has texture with curled, broken and hesitant lines which present the image of growth strength. These twisted imprints also provide unstable and rhythmical feelings.



Table 4.30 Water Plant, Twist-Dot



Water Plant

Twist – Dot

Paper

25x25cm



Original Concept water plant waving in water

Description The feature of this material is depicted with the idea of water plant. Repeating dot items are stuck one by one and then twisted to make water plant items. For expressing plant waving in water, these items are arranged in a free way to become the natural growth layout. Furthermore, its texture is flexible, soft and loose without any regular rules.

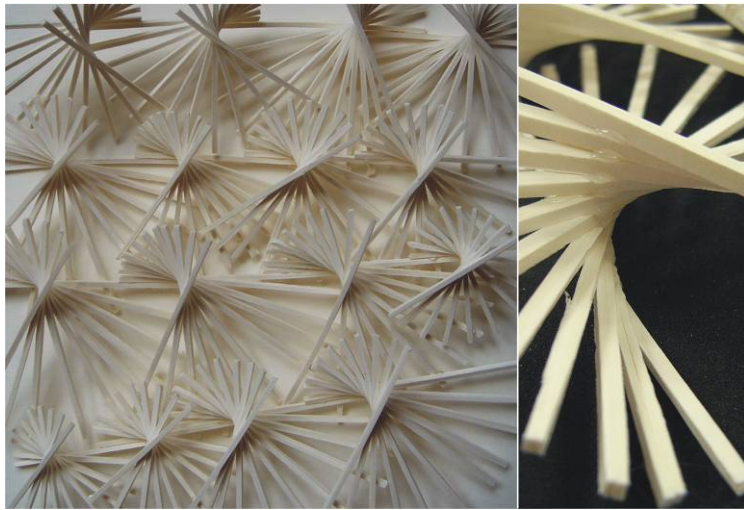


1. Make tiny paper items and stick them to be a line



2. Twist these line pieces to shape

Table 4.31 Twisting Leave, Twist-Line



Twisting Leaves

Twist – Line
Paper sticks
25x25cm



Original Concept vein structure of twisting leaf

Description This material shows the idea of twisting leaf structure with paper sticks. Several sticks are stuck one by one to make twisting shape items. Then items are joined to create a textile texture. However, the rhythm of repetition with various size items provides this material a special arrangement. These structural items provide shadow layers with beautiful tones of color. Because of twisting, this texture looks more unstable and dizzy visually. Furthermore, it has a pierce touch, uncomfortable and hard. Apart from the material construction, this texture is also like a kind of oriental pattern with a Chinese folding fan's structure. Thus, this material also provides oriental imagination such as neat or simple spirit.



1. Cut a paper card into many tiny, thin pieces



2. Glue each small piece one by one and by different directions to make an item
3. Stick these items one by one regularly

Table 4.32 Tobacco, Twist-Surface



Tobacco

Twist – Surface

Paper

25x25cm



Original Concept Twisting tobacco leaves

Description Like tobacco, these paper sheets have been twisted to make this shape. Paper sheets are dipped into water to get wet to be easily twisted. These twisted paper leaves are arranged in a gradational order, from straight to curvy, to exhibit the irregular rhythm of nature. The material texture looks unstable with these rumpled and rhythmical leaves. Then, the touché is thin, light and breakable.



1. Cut a piece of paper into long slices
2. Put these slices in the water to let them softer
3. Twist two slices together when they are humid to make an item
4. Stick these items together on a board

Table 4.33 Penetrate

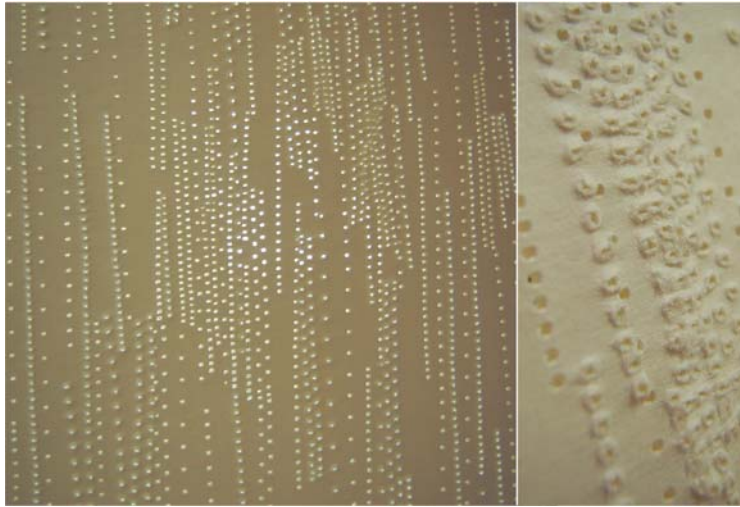
Penetrate



Penetrate means something moves into or through others. It is like an action of destroying objects, making corrosion, or causing scratches. Like the growth phenomenon of plant roots spreading inside soil. Roots growing freely to destroy the surface like a sewing machine penetrating fabric. This action expresses the strength of destruction which can transform flat texture into different appearance.



Table 4.34 Rainy Day, Penetrate-Dot



Rainy Day

Penetrate – Dot

Paper card

25x25cm



Original Concept sitting under a tree during the rain

Description During this project, sewing machine does an important work of describing patterns on paper without threads. It is a new idea to let the ragged texture come out from a flat board with personal awareness. This material took place from the idea of fallen rain drops depicting the imagination of seeing through the crevice under a tree. Drops are sewn in a gradational and rhythmical layout like a pouring rain. Rain drops are bright when seeing through tree leaves, thus, a better effect of this work is to view it under light. Furthermore, the texture with this technique provides a touch feeling of rain drops hitting on our skin when drizzling. It gives itchy and a little bit stressful feelings as well.



1.Sew tiny holes by sewing machine without any thread

Table 4.35 Scar, Penetrate-Line



Scar

Penetrate – Line
Paper card, tissue
25x25cm



Original Concept Something like a scar penetrating the surface.

Description In order to create the scar texture, soft and easily torn tissue is used for making it. However, the material comes from the idea of trees lying on snow which looks like scars on the soft skin. Tissue sewn with threads on paper card represents rough and biting trunks lying on snow. Slender branches are depicted by sewing machine without threads. Hairy paper card surface displays ground covered with thick snow. Thus, its texture makes viewers feel soft, ragged in touch and freezing in vision. The material layout is followed repeatedly and ordered arrangement. Trees with different figures are aligned in one direction which let the texture look neat but not bleak.

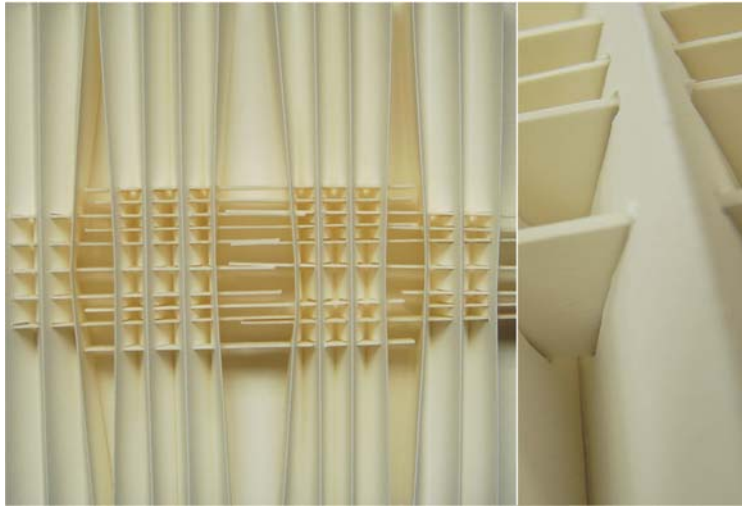


1. Scratch the surface of the paper card



2. Sew tissues on the surface and tear them away to make the pattern

Table 4.36 Stalks, Penetrate-Surface



Stalks

Penetrate – Surface

Paper, paper card

25x25cm



Original Concept Stalks penetrating through leaves

Description The idea comes from the partial structure of a leaf which composes of strong stalks and soft flesh. For displaying this idea, paper card slices treated as stalks are used to make the dense construction between soft folded paper sheets. Paper card slices are arranged horizontally across paper sheets to exhibit an image of stalk structure. Under this structure, the material texture becomes stronger and sharp in touch and architectural layout in vision. In addition, this texture provides rhythmical shadows inside the structure grids.

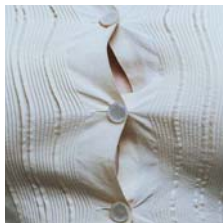


1. Cut holes on several pieces of thin and folded paper



2. connect folded paper sheets by putting thick paper cards through holes

Button



Button talks about fastening something, usually a piece of clothing, using buttons. This technique contains the relationship between pieces such as flower petals joining together. With many petals connected together, this texture become gradational with many layers and well arranged pattern. It feels thin, tender and elegant and it also provides beautiful shadow under the sun.



Table 4.38 Seeds, Button-Dot



Seeds

Button – Dot

Paper, tracing paper

25x25cm



Original Concept The texture of mushroom surface

Description Natural texture is irregular and has no rules sometimes. Such as this mushroom texture, the pattern grows freely on it. In this sample, a pile of soft paper becomes squashed texture when it is fixed by some pins on it. These pins like this mushroom texture provide a function in shaping paper to create the wrinkled texture freely. Then, free arrangement shows natural beauty in this material. However, its texture looks unstable and has a rich feeling in touch. Furthermore, speaking of redesign subject, useless paper can be used for this material instead of fine paper. Texturing paper surface through this way can transform original features into better ones.



Mushroom texture



1. Combine several pieces of thin paper by pins to make mushroom-liked texture

Table 4.39 Straws, Button-Line

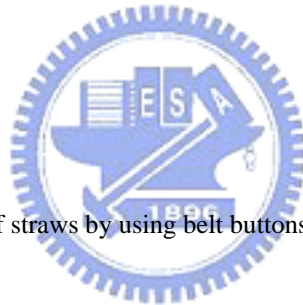


Straws

Button – Line

Rope

25x25cm



Original Concept Clean up a lot of straws by using belt buttons

Description For displaying the idea of messy straws separated into parts, ropes are used to make buttons to be the joints. Buttons provide the connection of every separated string groups. These rope buttons and string groups are organized by joining them together showing the repeating textile structure. In addition, this material texture provides soft curly hair and hard constraint impression. Thus, it has the conflict of looseness and tightness in vision, soft and hard in touch.



1. Make belt buttons by ropes
2. Connect lots of threads by using these buttons to make a textile arrangement

Table 4.40 Petals, Button-Surface



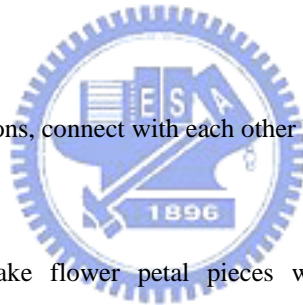
Petals

Button – Surface

Paper

25x25cm

Original Concept Petals, like buttons, connect with each other by themselves



Description Paper is cut to make flower petal pieces with connective joints. These paper petals are connected one by one through their joints to extend this material. However, the beauty of repetition is the concept of making this sample. Repeating paper petals are arranged in an order which gives viewers a balanced feeling. For describing the view of petals under the sun, they are made of thin paper which can provide gradational shadows. In addition, petals with button joints cause the repeating texture like a carpet and its shadow can be another effect under the light.

Texture shadow effect is decided by the figure of paper items and their connective joints. On one hand, different items provide different kinds of shadow pattern. On the other hand, the way of overlapping related to joint shape is important shadow pattern as well. Apart from paper, every thin material can be used for this material such as fabric, felt or plastic which can display the texture in other effects.



1. Cut down many petal shaped pieces of paper and connect them piece by piece

Roll



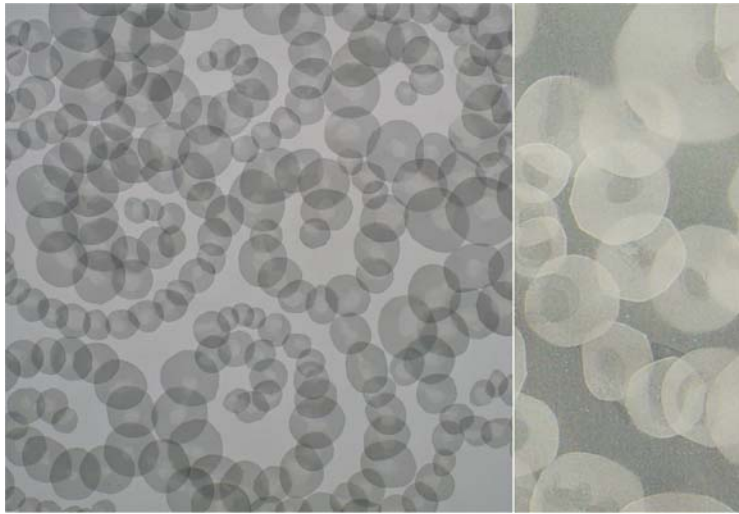
Roll is turning over onto itself to form a cylinder or a sphere. The layers of the round side become a kind of texture. Rolled stuff has the texture with round lines or layers arranged in a neat and crowded way. Like



some tropical fern, it has rolled growth structure with ordered and curled pattern.

This type of form develops an impression of energetic rhythm. Its texture touches rich and looks flexible.

Table 4.42 Fallen Petals, Roll-Dot



Fallen Petals

Roll – Dot

Paper card

25x25cm



Original Concept The imagination of petals falling down slowly

Description In order to describe this concept, tracing paper is used for making fallen petals. Tracing paper is thin and translucent which is better for depicting petal texture. Round paper pieces are arranged along rolling paths to create the scenery of fallen flowers. This rolling pattern has jumping rhythm which makes the material look dizzy but energetic. When seen under light, the texture providing gradational tones of translucent color looks like petals frozen in ice.



1. Cut many round pieces from tracing paper



2. Stick them one by one along rolling paths

Table 4.43 Fern, Roll-Line



Fern

Roll – Line
Paper for fax
25x25cm



Original Concept Repeating ferns grow together

Description With a rolled shape and a wrinkled texture, every fern item made by paper presents a vivid expression. According to textile making rules, this material is created by repeating paper fern items stick together freely. These items with different sizes display the irregular nature arrangement. Because of papers made this way, the material textures are hard and pierce in touch, thick and crowded in vision. It also has an impression of vitality from the look of the rolled items gathering together.



Fern' s figure



1. Roll up a piece of paper, put the roll inside a stick and squash it to make an item
2. Roll an item to become a ring shape and stick items together

Table 4.44 Rose Buds, Roll-Surface

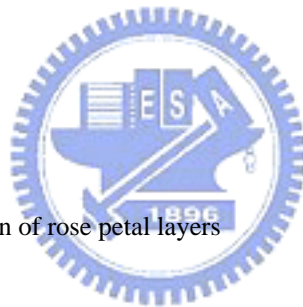


Rose Buds

Roll – Surface

Paper card

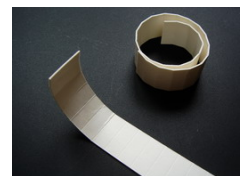
25x25cm



Original Concept Structural pattern of rose petal layers

Description The idea comes from an image of rose petal layers overlapping together. Made of paper cards rolled in layers, every single item has the transformation of rose texture. These abstract rose items are arranged together to create a new material. Its texture feels hard, thick and heavy because of the layered structure. With gradational layers, repeating items and random layout, this material expresses fresh and enthusiastic impression.

As seen from above, this material texture has beautiful and rhythmical pattern with these layers. Transforming layered pattern into other material or graphic may be a new idea for design. Such as its shadow projection or texture imprint, it has many effects for any application.



1. Cut a paper card into long slices
2. Scratch lines on every slice



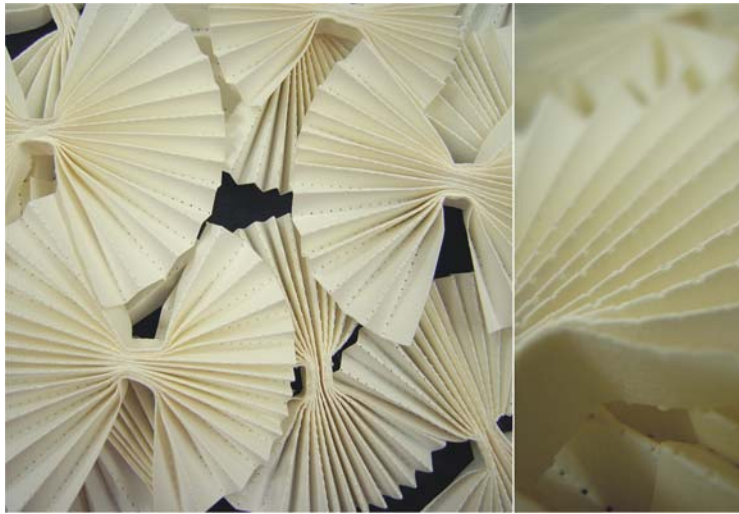
3. Roll and stick some slices to make a ring shape as an item
4. Stick these items together

Fold



Fold is a skill of bending something, especially paper or cloth, so that one part of it lies on the other part. It is a skill used for forming everything with many layers and related to transformation of a rose-like or mushroom-like appearance. Natural structure has the most beautiful pattern in the word. Like the back of mushroom, layers and layers folded together provide neat and regular texture. The beauty of repetition and gradation are shown in its texture.

Table 4.46 Folded Leaves, Fold-Dot



Folded Leaves

Fold – Dot

Paper

25x25cm

Original Concept Folded lotus leaf



Description Inspired from origami art, folding line is important when constructing form. Different from the original one, lines with tiny dots made by sewing machine provide not only folding function but also texture on paper. This sample is created by using this skill to construct the form of lotus leaf. Folded paper leaves are overlapped one by one freely to create this material. The material has two layers to increase its thickness which provides texture gradation.

Lines with many dots have rough and hairy texture after folding. This effect can be used for designing books. Book pages folded with these lines may have special texture on its side part.

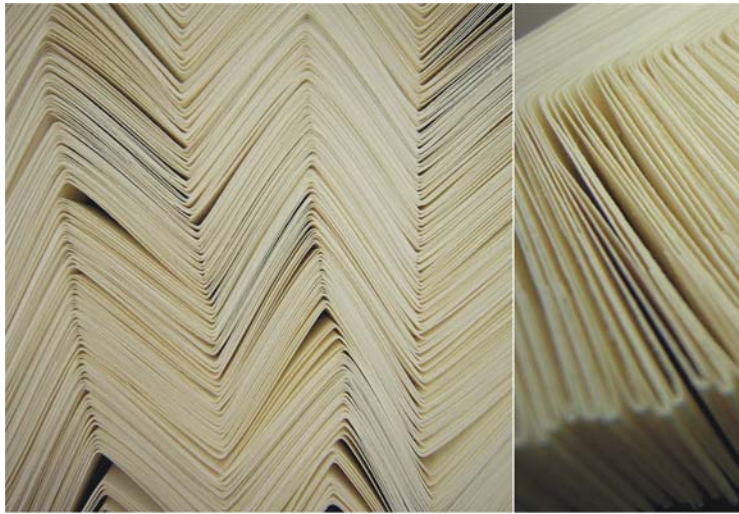


1. Sew lines without thread to make folding path



2. fold and shape to make items

Table 4.47 Mushroom Layers, Fold-Line



Mushroom Layers

Fold – Line

Paper

25x25cm

Original Concept Texture of fungus



Description For imitating the texture of fungus, paper is cut into many slices and folded to create this texture by connecting them piece by piece with sticks or strings inside. With ordered paper slices, regular line pattern on the top, and simple structure, the texture provides the beauty of repetition and aggregation in this material design. It touches thick, heavy and sharp. Its clean, neat and simple characters present oriental style, particularly with paper. This material is strong with paper slices connected like this way. It can accept heavy weight on top. With this structural character, it can be applied to many designs like pot mat or doormat.



Texture of fungus



1. Fold slices of paper connect these slices with strings

Table 4.48 Fruit Slices, Fold-Surface



Fruit Slices

Fold – Surface

Paper card

25x25cm



Original Concept Pattern of lemon slices

Description In order to express the material with texture of lemon slices, paper statuary is used for this to depict the natural pattern. Bound and folded paper items have beautiful texture with repeating paper slices. They are connected with each other in a free way to express uncontrolled natural beauty. The material has light and elegant texture with this form. Especially the effect under light, it provides shadow projection with pretty blossom pattern.

For further design, every item of this material can be changed to get other texture appearance. The form of these items changes depending on the shape of paper slices and the construction.



1. assemble slices of paper by binding in the middle of them with a thread



2. fold each slices into the central part

5. Application of Material Collection

For achieving the process of applying material collection to product design, here is a design process to demonstrate it. Every material can be deconstructed to get different characters for different projects such as this design process.

Glass sleeve Design

Glass sleeve is a product which can properly display not only texture but also function. In this case, how to create a method of texture design in product is the main purpose.

Design Brief

Design the texture of glass sleeve for a set of glass and one material is needed to be used to display its various features on them.

Description

For this design, the material features will be separated into several parts for functional, form or decorative sleeve design. Keeping original textural characteristics is the most important direction here.

There are 6 glass sleeves will be designed for different drinks by using material “Fold-Line” (refer to Table 4.47) from material collection. Depending on these drinks, characters which material “Fold-Line” (refer to Table 4.47) has such as its texture, structure, or pattern will be used for every sleeve design with other materials or colors. In addition, 4 glass sleeves created by using different material from the collection will present the variety of the application. Depending on different drinks, different material and their texture will be used on these sleeves. All the results will be shown next page. (Table 5.1~6 and Table 5.7~10)

Table 5.1 Product Design 1



Design 1

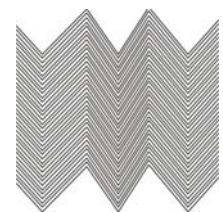
Glass Sleeve for Milk

Fabric

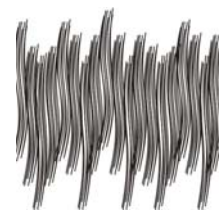
10x8x5cm



Milk gives people warm, smooth, thick and soft feelings. In order to describe these feelings on a glass sleeve, thick fabric is used as material for this design. Inspired from the texture of material “Fold-Line” (refer to Table 4.47), bent lines and layers provide the feeling of thickness. This design is made of many round pieces connected together to make crowded layers. These curled lines look free and smooth. The outline of this sleeve is also curled to display warm impression. It touches soft and warm because of fabric and the design construction.



“Fold - Line” texture with repeated lines



Texture with curled and repeated lines

Table 5.2 Product Design 2



Design 2

Glass Sleeve for Juice

Felt

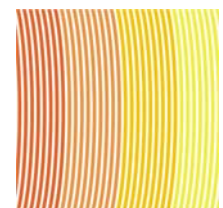
10x5x2.5cm



Fresh, smooth, colorful and healthy are the impressions of juice. For presenting these impressions, colorful felt is a proper material for this sleeve making. Its soft and rich touch presents thick juice with flesh inside. The form and texture of this design come from material “Fold-Line” (refer to Table 4.47) with its enlarged texture. It is straight and gradational layer by layer which can be used for color design on this glass sleeve. This glass sleeve is made of different tones of orange displaying fresh and friendly impressions. It looks tasty with these colors and touches soft and thick with felt.



“Fold - Line” texture with gradational layers



gradational tones of orange

Table 5.3 Product Design 3



Design 3

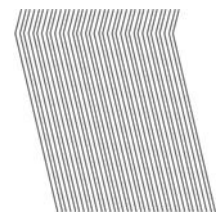
Glass Sleeve for Green Tea

Kraft

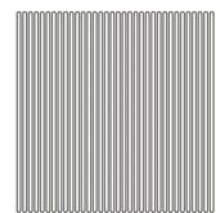
8x3x1.5cm



In Chinese, people usually drink hot green tea with small cups. Green tea has refreshing fragrance, clear color, and tastes a little bit bitter. Material “Fold-Line” (refer to Table 4.47) texture provides the expression of oriental and simple characters which is proper for this design. This glass sleeve is made of kraft piece by piece inspired from the straight pattern of material “fold-line”. Kraft is brown in color with rough texture presenting the impression of nature and pristine. The straight pattern used for designing its form and repeating texture displays oriental images.



Straight line texture of material “Fold - Line”



Straight lines with folded kraft



Design 4

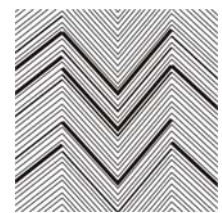
Glass Sleeve for Coffee

Paper Board

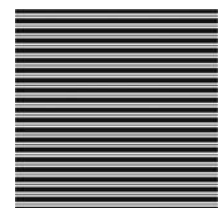
12x9x6cm



Hot coffee is warm and has strong flavor with milk mixing inside. For presenting these impression paper board is used for creating this design. It has 3 layers and 2 colors in light and dark brown. The glass sleeve is designed with the idea of gradation and repetition which is from the arrangement of material “Fold-Line” (refer to Table 4.47). This paper board provides the image of mix when stuck together because of these two different colors. Its strong color expresses the impression of coffee’s strong, bitter flavor and color. The rough outline of coffee shape provides more imagination when drinking coffee.



“Fold - Line” pattern with different thickness



Pattern of paper board layers



Design 5

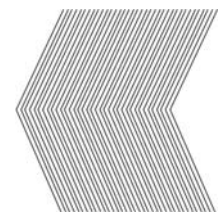
Glass Sleeve for Cocktail

Gold PVC

8x7x1.5cm



Cocktail with this glass has sexy and stylish impression. In order to display this impression, the glass sleeve is designed to become a gold dress wearing on the glass. According to material “Fold-Line” (refer to Table 4.47), it is created with the texture of repeating gold pvc slices to show the gradational reflection.



Shape of “Fold-Line”



Dress form transformed from “Fold-Line”

Table 5.6 Product Design 6



Design 6

Glass Sleeve for Vodka

Concrete

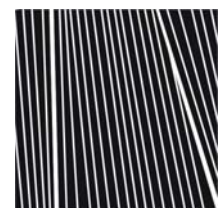
8x8x4.5cm



Vodka with 50% alcoholicity, drunk with ice cubes, has tough and strong impression. Its glass sleeve is made of concrete which looks cool and cold with the masculine shape and bent lines. The texture on the sleeve comes from material “Fold-Line” (refer to Table 4.47). Folded lines have been transformed into pattern on this glass sleeve to display its texture.



The enlarged and lumpy pattern of “Fold-line”



Lumpy texture formed with concrete

Table 5.7 Product Design A



Design A

Glass Sleeve for Milk



Paper

8x8x4.5cm

Milk group is about drinks mixing with milk such as milk tea, soy milk or coffee. These milky drinks have characters of warm, thick, and smooth in taste. For displaying these characters in various ways, material “Roll-Line” (refer to Table 4.43), “Weave-Line” (refer to Table 4.3) and “Weave-Surface” (refer to Table 4.4) with similar impressions has been transformed to design. Combining white paper and ribbon is the main concept for these sleeve series design. All of them are made by different techniques like rolling, binding, knitting or weaving to display texture with loops. Loops made of paper touch warm and thick; and provide the impression of mixing or smooth.



Table 5.8 Product Design B



Design B

Glass Sleeve for Juice

Plastic, thread

8x8x4.5cm



This group is composed of many kinds of juice like orange juice, lemon juice, apple juice and so on. Juice gives us fresh and enthusiastic impressions because of its rich nutrition, ingredients and colors. According to this inspiration, material “Sew-Line” (refer to Table 4.11) has rough and rich texture touched like the imagination of flesh floating in juice. However, these glass sleeves for juice are designed with colorful threads sewing freely on plastic surface to make rough texture. Using transparent, bright and artificial plastic bag as the base surface for sewing gives as freezing impression as well.

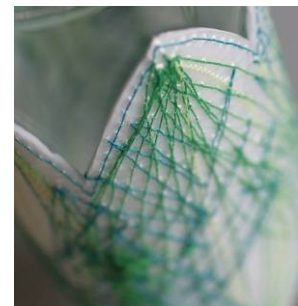


Table 5.9 Product Design C



Design C

Glass Sleeve for Alcohol

Rubber

8x8x4.5cm

No matter what kinds of alcohol, spirits, cocktail, or beer, drinking has the impression of sexy and crazy. For displaying sexy style, combining rubber and feminine technique is the main idea in this design. Feminine technique such as knitting or crocheting gives viewers delicate, soft and sweet impression. Rubber for making tire is a tough and strong material. Inspired from the material “Weave-Line” (refer to Table 4.3), this glass sleeve design is made of rubber with knitting and crocheting skill to display the expression of sexy style. In addition to normal function, this rubber sleeve may be the cushion to protect glass.



Table 5.10 Product Design D



Design D

Glass Sleeve for Black Tea

Kraft

8x8x4.5cm



Most of tea tastes bitter or astringent which is related to simple and primitive character. For this imagination, products are designed by using kraft paper because of its color with ragged texture. Besides, the texture concept comes from material “Fold-Line” (refer to Table 4.47) and “String-Surface” (refer to Table 4.24) describing not only these characters but tea leaf imagination. Kraft with different thickness provides various figures, hardness and colors; it can be used for different flavors of tea. Besides the function for protecting form heat, it may be designed for package. Combining glass sleeve and package may be not only a protection when transportation, but also a product for use.



6. Discussion

After the exploration with research, analysis, producing and design process, this chapter is going to discuss the whole process and provide suggestion afterwards.

6.1 Discussion

This part contains discussion of new viewpoint, potential or feedback found during exploration process and exhibition. This discussion may help me and viewers think more when reading or doing similar design process.

6.1.1 New viewpoint in Material Collection making process

(1) The combination of paper and textile brings new material feature, structure and texture. First of all, this material feature includes both features such as paper-liked textile or textile-liked paper. Secondly, material structure comes based on both techniques which is the limitation but brings forth new texture during the making process. Finally, material texture becomes conflicting figures in one sample like hard and flexible, or thick and light.

(2) Textile element construction used in paper depends on several rules like repetition, regular or irregular arrangement, structure and material. Element repetition in textile causes the first impression of textures. Repeating elements arranged regularly or irregularly make different layout. The structure provides not only the connection of every element but functional association of other designs. Furthermore, different kinds of paper can bring individual texture depending on idea concepts.

(3) Imagination and transformation of plant characters have been explored in this project. According to the observation, plant characters are cataloged into three parts, growth structure, natural phenomenon and plant appearance which provide directions of creating image ideas for texture design.

(4) Relationship of plant imagination and textile techniques brings texture identity related subject. Textile identity includes characters like layout arrangement, element (unit) shapes and connective structure. However, these characters should be designed in well combination with personal awareness to display each subject.

6.1.2 Material Collection application

(1) Material collection application in product design has been suggested in this project. For example, combination of texture and material, shadow representation of texture, structure of texture, and identity of texture, refer to chapter 3. They can be used or combined with each other when undergoing design process. Such as the product design demonstration in this project, each glass sleeve is created by combining some material characters, refer to chapter 4.

(2) During this design process, the relationship of material texture and touch or taste feelings should have strong connection. For example, glass sleeve for milk (Fig 6.1) with soft fabric and curled lines has a strong impression of its taste. Glass sleeve for cocktail (Fig 6.2) designed with gold and high reflection is not proper for its impression, but the effect fits whiskey in the glass with ice cubes.



Fig 6.1 Glass sleeve for milk

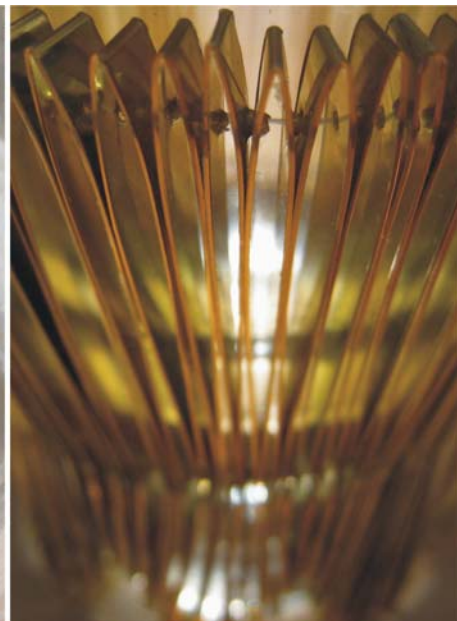


Fig 6.2 Glass sleeve for cocktail

(3) For further design, the commercial purpose may be considered in the process. Like the glass sleeve for alcohol (Fig 6.3), it is made of rubber. Rubber sleeve provides protection not only for both hands from heat or coldness, but also for glass from collision during transportation. Therefore, the sleeve would be a package for commercial worth.



Fig 6.3 Rubber glass sleeve



6.1.3 Exploration Process

(1) New opinions of designing exploration process have been given in this project. Keeping building objects, recording and criticizing every process can bring new viewpoints which help to filter chaotic information. Building objects through hands can bring familiarity with materials and techniques. Experiencing more on them can promote more idea expression. Furthermore, not only new ideas will be generated but experience will be kept in mind for further design. Recording working details during process provides evidence of every work. Working details should be written down during the creation process whether successful or failed in order to know more about what has been done and its incidental surprises. Criticizing every work is important in this project. Objects are created through hands with ideas in mind. However, there should be gaps between brain and hands. Doing working critics helps to reduce these gaps and learn more experience from them.

(2) During the process, making material and designing product should happen at the same time. Material provides product design process some inspiration, and so does product design. In this project, material making and product design are two different processes which are done at the same period. Knowing every work and its problems in both processes helps to get wider or deeper concept expressions. These two processes affect each other to stimulate new viewpoints producing.

(3) Exploration methodology has existed and can be reorganized freely to get various results. Take this project for instance, if the exploration directions (refer to chapter 3) of material design were changed, the appearance of every work will be different as well.

(4) The scope of design subject should not be wide. Like the very beginning of this project, the subject is about representing plant without any other restriction while there are too many problems needed to be solved in the process. Every production under the subject has individual figure which is not easy to be organized for developing a collection.

Looking back to this project, it contains three different subjects, plant texture, paper and textile. Every subject has professional knowledge, every material has its special techniques, and every technique causes specific forms. In this material making project, there should be more restriction to avoid the confusion of subject, material and technique. Some material design, like Pile-Surface, Button-Surface or Sew-Surface (Fig 6.4), are completed with these three original subjects, plant texture, paper and textile technique. They provide successful construction with arrangement, texture and structure. Some are made without textile constructive factors which cause failed and useless objects like Roll-Surface, Fold-Dot or Button-Line (Fig 6.5). Nevertheless, for this kind of project, the scope of design subject should not be wide and the smaller the better. Clear objective, controlled steps and more restriction can reduce the confusion in design process.

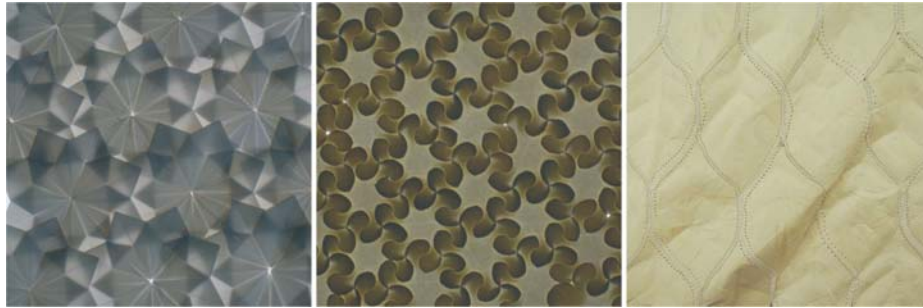
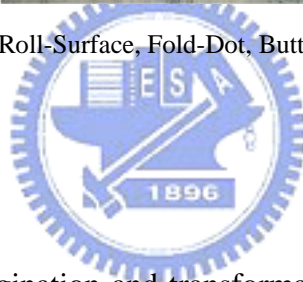


Fig 6.4 Pile-Surface, Button-Surface, Sew-Surface



Fig 6.5 Roll-Surface, Fold-Dot, Button-Line



6.2 Distribution

This project provides imagination and transformation of plant texture which can be used for any design. Different from flat textile design, material texture has been made in three-dimension which can also be applied to installation, partition, or decoration. However, raw material is changed to become organized texture which may have practical function in product and jewelry design.

From references, textile and plant characters; to figuring out the ways of transformation, from material collection making to product design, the whole project has provided a new exploration process which can inspire designers during design work.

This project represents the relationship of paper, textile and plant to create a material collection. This process and result may help people think about the connection of these three ordinary materials while develop the ability of using materials through all productions. For designers, I hope the ability of association can be evoked to treat normal things as special in design process.

6.3 Suggestion

After this project, there are problems and suggestions that may be helpful for future studies such as the difference between raw ideas and final material productions; there are always problems of expressing ideas in the brain by handmade process. Furthermore, three-dimensional texture has the relationship of object and shade, there may be something needed to be found. If colors are added into material, is anything changed? The combination of different material and techniques may cause different representation. The rule of transformation also brings various results. Products could be research tools to realize the relationship of material texture and taste or touch impression. Nevertheless, these questions may be worthy to be discussed in the future.



7. Exhibition

The exhibition of this project starts on the 19th of June, 2008. And this chapter records the installation design, working process, the way of exhibiting material collection, product design and the light arrangement of this exhibition.

Installation design and working process

Installation is designed in a simple and clear way. All objects for setting up are made by wood, some are without painting and the others are white in color. In order to guide viewers to realize the process of whole project, material collection should be seen at the first time and its application should be after. In this space (Fig 7.1), material collection is installed on the biggest side seen directly from the entrance. Glass sleeve series is set up beside material collection. Therefore, the visiting starts from material collection and then products on both sides of the space.



Fig 7.1 Installation

Material Collection section

Because every material sample is made of paper and white in color, material collection should be exhibited to provide a natural and raw impression. For this purpose, every sample is fit in a timber frame with rough and uncovered texture. (Fig 7.2) Material collection is set up orderly next to the wall in order to project shadow onto it. Material collection and its shadow provide more gradational effect when they are exhibited under the light. (Fig 7.3)



Fig 7.2 Samples with wooden frames



Fig 7.3 Shadow projected on the wall

Product Design section

Two series of glass sleeve design is set up on both side of the space. The main series which has six glass sleeves is exhibited separately with six high stands. This series presents the capability of material collection application. The other one with several glass sleeves is set up on lower stands in order to show the various usage of material collection. (Fig 7.4)



Fig 7.4 Product's setting up

Light arrangement

The light arrangement for the exhibition space is clear and strong instead of complicated way. For material collection, light spreads evenly on material samples and makes interlaced shadow on the wall. And in order to show the particular material “Fold-Line” applied to glass sleeve design, one highlight projects on it. In addition, for exhibiting glass sleeve series, strong light for every design is necessary because of the small products. Moreover, the floor also needs some light reflection, and the weak the better. Therefore, the space is not only clear to guide viewers' visiting, but also comfortable to enjoy the atmosphere. (Fig 7.5)



Fig 7.5 Light arrangement



The exhibition detail recorded here provides a working process to help people realize more experience. Regardless of installation design, visiting path or light arrangement, every work has been designed for viewers enjoying more the space and all artworks. In addition, every design object has detail description to help people understand more ideas.

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