

Chinese Seal Clasp—Meeting technology and elegance with functional goals

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Abstract. This study comes within the framework of a PhD course in Design, which is the continuation of a Masters degree research in Fashion Design, searching for wardrobe technology and innovation, through the use of three-dimensional computer-aided design and printing, with its use already popular in areas related to product development and design, as well as architecture, translating and adapting, integrating it into the world of Fashion. The intent of this project is to present solutions that promote a new and versatile product, allowing for a different kind of aesthetic. This will be achieved and presented through planning and prototyping, thus creating a new clasp for fashion products. This research will result in a finished clasp, with its purpose and function being tested, in order to achieve concrete results, thus creating an innovative technology to be part of a fashion collection that allows the transformation of the suntan marks left by female swimwear. This will result in the creation of designs and drawings on the body, using shapes inspired by the Oriental Zodiac Signs, as well as colours drawn from the five elements of *Feng Shui*, which are also present in the Western Astrological Signs.

1 Introduction

Computer-aided Design for Manufacturing and its potential for creating unique and new types of objects, shapes and designs has been one of the main themes and subjects of this research, as its ability for conceiving printable objects for production allows the achievement of new creative boundaries.

The cultural fusion intended lies in the overall concept and design of the collection, but also finds its way into the little details, that make up part of the whole.

2 Design and concept within Chinese seal history

“As an important symbol of traditional Chinese culture, the evolution and development of the Chinese seals reflect the rich connotations of Chinese civilization.”[1]

More specifically, the clasps used derive their inspiration from elements present in Chinese culture, and the drawings and the form of ancient seals, merging both form and function.

The look of this Chinese seal clasps are made after the official seals during the Western Han Dynasty (206 B.C.-9 A.D.)

“...square, gentle, solemn, elegant, profound and simple...” [1]

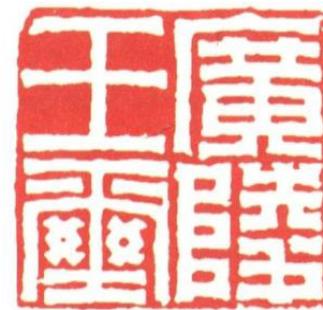


Figure 1. Seal of Prince Gualing [1].

This clasp seal, based on a full research on the history of these ancient Chinese objects can come in two different designs, just like the two different character cutting techniques that were used in their manufacture.

More specifically, the inspiration for the design of the clasps derives from elements present in Chinese culture, and the drawings and the form of ancient seals, merging both form and function with their inherent conceptual and theoretical values.

According to Rudolf Arnheim: “The artistic imagination can be described approximately with the discovery of a new form for an old content, or – if you do not want to use the convenient dichotomy between form and content – as a new concept of an old subject”.[2]

3 Planning before the manufacture

Like the industrial production process and design planning,[3] there were made several technical drawings of the different aspects and projections of the clasps, ranging from plans of the superior and inferior faces, lateral sections, as well as transverse and longitudinal ones.

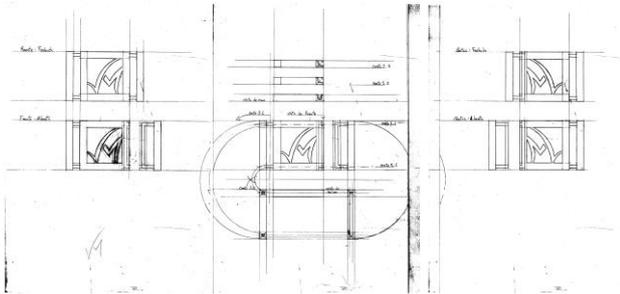


Figure 2. Product planning – All the different views [4].

3.1 Axonometry

After the multiple different views were drawn, an axonometric drawing was made to clarify its final form based on the previous studies.

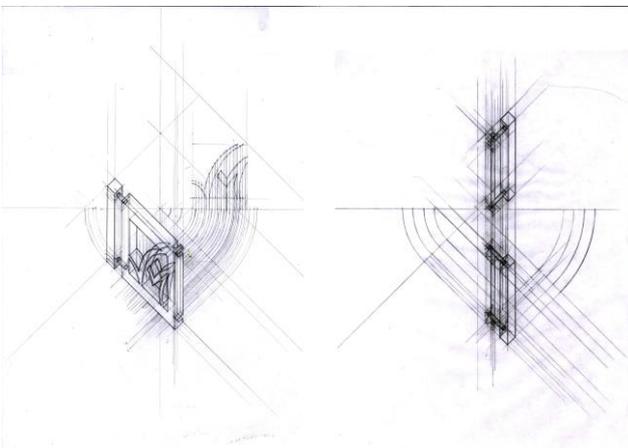


Figure 3. Hand drawn product planning [4].

4 AutoCAD use in 2D prototyping

In order to assure the correct dimension and accuracy of the drawings 2D prototypes were conceived to allow the cutting of the materials using laser technology. These were specifically designed to verify and test the results and effectiveness of the drawing area on the skin.

AutoCAD 2D drawing was made to cut a thin acrylic sheet, 0,5 millimetre thick.

The thickness of the material was chosen due to the laser cutting characteristics, thicker materials are prone to be deformed, due to laser incidence, making the top side thinner than the bottom side of the acrylic sheet.

The choice of the material was also conditioned due to the laser cutting equipment characteristics.



Figure 4. 2D AutoCAD printable drawing [4].

5 Modelling and Printing in 3D

3D modelling programs have a very important role in achieving these goals, by allowing detailed, yet resistant shapes to be carved.

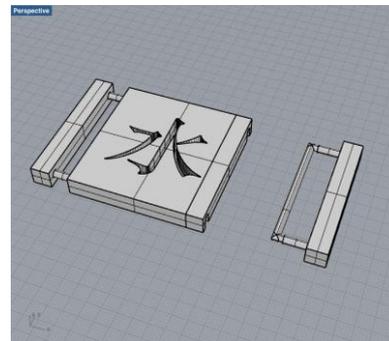


Figure 5. 3D Model ready to print [5].

The possibilities are endless with this printing, depending on the materials used, our own imagination and creativity. – “Creativity is a productive capacity where fantasy and reason are associated...”[2] – There is also the possibility of either gluing or linking several elements together, in order to achieve more complex shapes and objects.

This results in the creation of accessories that correspond to the concept of aesthetics, beauty and seduction which are desired in underwear and beachwear design.

Chinese *Feng Shui* elements are specially relevant when it comes to colour, because “It is an old concern for mankind, the desire to reproduce the colours of nature in everything that surrounds him. That understands a deep psychological meaning, seeming to be one of mankind’s basic needs...”.[6]

Therefore, the clasp’s colours are chosen within the range corresponding to each of the *Feng Shui* elements. Water, earth, fire, wood, and metal: black, brown, fire red, light green and white respectively.

After making the 3D print, to test materials and colours, 2D prototypes were intended for printing, to allow and create the perception of how the final product is going to look. It is possible to achieve this in two ways, by creating a mould extracted from a 3D printed

prototype or direct 3D printing in the materials intended for use.



Figure 6. 3D and 2D models printed side by side [4].

The transparent, or non-pigmented clasp, has the purpose of allowing the sun's rays to go through, leaving no skin mark at all. It is intended to provide the user with the choice of not having a tan mark, having been tested and proven to allow the passage of U.V. rays, leaving only a very light mark on the skin.



Figure 7. Transparent acrylic tested on skin [4].



Figure 8. Transparent acrylic 2D print test [4].

6 Goals and Objectives

This Design PhD research is aimed at Fashion Design of feminine beachwear, making use of *Feng Shui* as a deep source of inspiration, as well as product design technologies.

6.1 Fashion Design

The conception of a design for swimwear and beachwear purposes seeks to combine comfort, practicality, function, as well as beauty, seduction and desire associated with them, creating an illusion of nudity, of transparency, of fluidity.

This results in the creation of accessories that correspond to this concept of aesthetics, becoming more than merely functional objects, reinventing them.

For the clasp to become functional, the application of a layer of silicone, on the side that comes into contact with the users body is going to be considered and studied, in order to provide a greater adherence to the skin, allowing for a more precise tattooing of the skin by holding it in place.

It is a matter of function, and concern with the users confort, thus creating a product that is ergonomic and has the wearers best interests in mind.

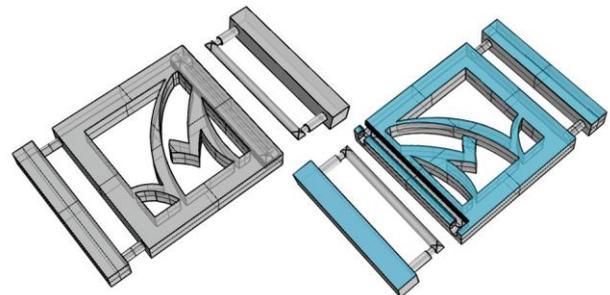


Figure 9. Clasp seal front and back view respectively. The blue area is marking the side designed to receive the silicone layer, to be in contact with the user skin for adherence [5].

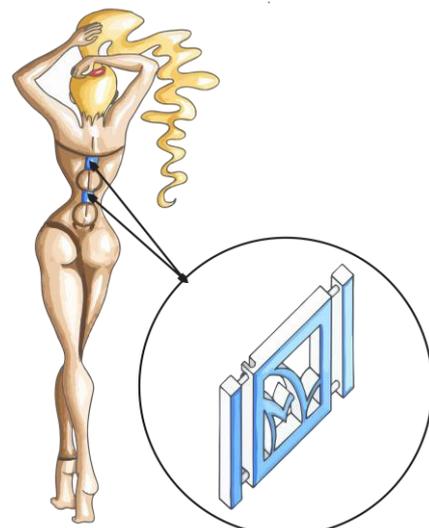


Figure 10. Clasp seal back view illustration [4].

It will also need an instructional label, so that the user knows how to wear the product correctly, in order to use the clothing to its fullest.

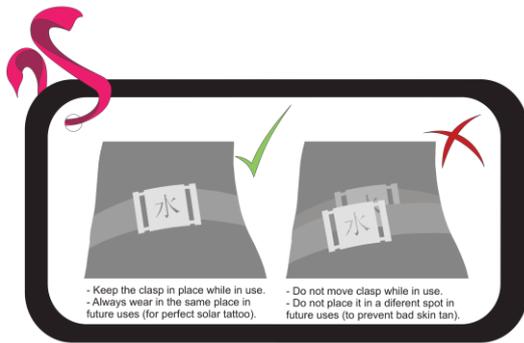


Figure 11. Hanzi clasp seal instructional label [5].

This instructional label, can be available in both formats: Hanzi and Logo, to clarify the correct use of the clasp.

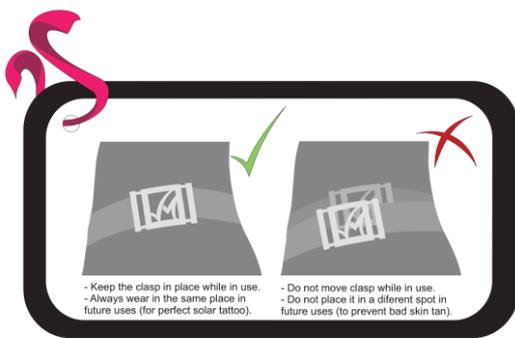


Figure 12. Logo clasp seal instructional label [5].

6.2 New Tecnology

Designed with materials that allow the blocking and/or passage of ultra-violet lighting, it results in the "printing" of a "solar drawing", on the user's skin through natural sunbathing.[4]



Figure 13. Test of the application of the textile technology [4].

Together with the use of new textile technologies and solutions, it's a single part of a whole swimwear product, built to provide a new form of interaction between skin and sun.



Figure 14. Skin tan result from textile tecnology [5].



Figure 15. Skin tan result expected from hanzi clasp seal [5].



Figure 16. Skin tan result expected from logo clasp seal [5].

7 Final Objectives

The final product is the result of an intensive study of this ancient utensils,[1] created through careful planning and drawing, in order to represent its detail to the fullest.

Elegant, and yet simple in its fluid shape, these clasps create not only a bridge between the Portuguese enjoyment of beach/water activities with the ancient culture of China, but also between the Far East and the West, a fusion of cultures that, hopefully, will result in the enrichment of both.

It is a product intended to invite, entice and intrigue, to attract the Chinese people to enjoy the pleasures of beach going, as well as to introduce to western beachgoers the mysterious and fascinating art of *Feng Shui*, exposing them to the rich history of a captivating and fascinating culture.

As a final goal, this clasp is intended to produce a skin print, to match the textile tattoo print, leaving a

Chinese seal imprinted on the user, with a logo, sign or element with a strong reference to Chinese culture.

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