

Estonian Academy of Arts

EKA

Folding Leather

The mysticism of objects

Sigrid Barranco Ballonga

MA Thesis

MDC21

Accessory and Bookbinding Department

Supervisor: Gary Markle

Tallinn

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ABSTRACT

Folding Leather. The mysticism of objects.

This thesis investigates the causes of the mysticism that surrounds an extraordinary object, specifically a small Moroccan purse that came into my hands two years ago. A purse from which this practice arises and which encompasses two of its main pillars; leathercraft and paper folding. Through autoethnography, artistic and anthropological research, I reflect on the relationship between human-object-nature and why this object could have a special significance. In addition, from the point of view of craftsmanship, it is questioned how to create objects with a similar significance; how to redo its creation and rethink its design and how to find the word of the material to obtain a new innovative dialogue. This process is developed through experimentation and reflection where the artisan collaborates closely with the fold and the material and listens to its nature. The creation of artefacts applying paper folding techniques performs a fundamental role. Specifically, the application of geometric motifs, spirals and twists that resembles the design of the purse. Its materialisation is carried out mainly in leather, since it is the utilitarian material that most closely resembles paper, in addition to leather-derived materials such as parchment, rawhide, and bonded leather. The experimentation ends with the symbolic creation of small artefacts that suggest a possible application of the combined technique with the hope of providing future advantages to the field of leathercraft and the creation of small accessories. Moreover, the spectator is invited to interact with them imagining their future.

Keywords: Experimentation, folding, leather, mysticism, origami.

KOKKUVÕTE

Volditud Nahk. Objektide müstilisus.

Käesolev magistritöö uurib erakordset eset saatva müstilisuse tagamaid – täpsemalt on tegu ühe kahe aasta eest minuni jõudnud väikese Maroko rahakotiga. Sellest kotist on ajendatud ka minu praegune praktika ning selle kaks peamist tugisammast: nahakunst ja paberi voltimine. Tuginedes autoetnograafiale, loovuurimusele ja antropoloogilisele uurimusele, mõtisklen ma inimese, esemete ja nende olemuse vaheliste suhete üle, uurides ühtlasi, mis annab ühele objektile erilise tähenduse. Taide seisukohalt on oluline ka küsimus, kuidas luua objekte, mis oleksid sarnaselt tähenduslikud, kuidas neid omakorda taasluua, ümber kujundada, kuidas astuda materjaliga innovaatilisesse dialoogi. Protsess põhines katsetustel ja mõttetööl, tihedas kontaktis volditud osa ja materjaliga, lähtudes selle olemusest. Magistritöö oluliseks osaks on töö materjalis, kasutades paberi voltimise tehnikaid. Eriti geomeetriliste motiiviide, spiraalide ja pöörete kasutamine, mis lähtuvad koti disainist. Materjalina on kasutatud eelkõige nahka, arvestades, et see on praktiline materjal, mis sarnaneb kõige enam paberile (lisaks teistele nahapõhistele materjalidele, nagu pärgament, toornahk ja komposiitnahk). Mängulise eksperimenteerimise tulemusena on sümboolselt valminud seeria väikeseid artefakte, mis näitab kombineeritud tehnika üht võimalikku rakendust, lootuses lisada nahakunsti valdkonda ja väikeaksessuaride tootmisesse uut lähenemist. Magistritöö väljapanekul on vaataja oodatud loodud objektidega interaktiivselt suhestuma ning nende tulevikku kujutlema.

Märksõnad: katsetamine, voltimine, nahk, müstika, origami.

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And lastly, thanks to my mum for giving me life, I know you would be proud of me.

INTRODUCTION

This project focuses on exploring the reasons why an object has the potential to become significant for the human and manifest certain mysticism. Specifically, a small Moroccan coin purse, made of thin folded leather, that crossed my path. As well as the experimentation and application of its technique with the intention of creating objects with a similar significance. This thesis is framed in the practical field of leathercrafts and the art of paper folding (origami). Where initial questions are investigated such as the significance and possibilities of artefacts born from paper folding technique applied to fine leather and their valuation in the field of crafts and the development of small accessories. The project is approached through autoethnographic, anthropological, artistic and practice-led research and its structure is divided into two main phases:

The first one, a reflective phase where the methodologies mentioned above are applied. Here a brief positioning of my background and interests is displayed, besides a reflection on the origins of my personal connection with objects as well as those of people close to me. For this, examples from a brief survey carried out in relation to the significance of objects, are used. Starting from the Moroccan coin purse as a focus of study, anthropological questions related to the nature of the object, its human engagement and its temporal history are developed. This reasoning is developed and supported through literary review; specifically the book *The Beauty of Everyday Things* written by the Japanese philosopher Soetsu Yanagui.

The second phase is based on the conceptual, formal and material experimentation of the Moroccan coin purse as a starting point. In this phase, a series of practical tests are carried out related to the folding of geometric shapes, spirals and twists in vegetable-tanned leather, parchment and bonded leather. Most of the shapes are reproductions of designs by well-known origami artists like Ekaterina Lukashova, Jun Mitani, Chris K. Palmer and Roman Remme. In this experimentation, I work both digitally, creating 3D moulds in order to transfer the pattern onto the material, and manually, hand-forming the design. For this, the artisan maintains an intimate dialogue with the material, as in the practices of Maarit Mäkelä (2022) and Nithikul Nimkulrat (2009), expressed in the form of audiovisual content where the 'fold' experiences the world around, its nature and its interaction with the human. Finally, as a result of this experimental and reflective process, shape variations are born, and a combined technique is developed and applied in the creation of 3 interactive artefacts where the final aim is to invite the viewer to manipulate these experiments, reflect and imagine their future.

This project arises from the personal motivation of two present disciplines in my professional path: papercraft and leathercraft. A challenge that combines engineering, arts and design; and that seeks to gain a better understanding of the limits and possibilities of these combined disciplines, in addition to tangible knowledge gaining and improvement of skills. When I came to EKA I wanted to get away from engineering to be able to get closer contact with the object-creating process and a new point of view as a designer. That is why I consider this project as a good compilation of my path during this master's degree.

BACKGROUND

Paper and Leather

My interest in paper started approximately 10 years ago during a boring September afternoon in the north of Spain, Zaragoza (2013). Browsing on the internet I found a video called *Origami Tyrannosaurus Rex (John Montroll) - Dinosaur #1* by Jo Nakashima ([Nakashima](#)). I imagine I didn't want to start with the ubiquitous crane shape that everybody learns at school. I followed the steps, I folded every corner, I turned the valleys in mountains and the mountains in valleys... After 12 minutes, I finished the shape. There it was, a green paper T-Rex. It felt amazing. I was proud of something I had created in less than half an hour. I kept the piece and I even took a picture of it, with a white background as if it was a collectable piece of art. During that year, little by little, I created a big family of origami animals and creatures that I deposited on my room's shelf as trophies. Something in the process made me love it. After that, my next big academic projects were based on the medium of paper: *Wes Anderson Pop-Up Book*^[1], thesis for Engineering in Product Design BA and *Fruit and vegetable consumption advertisement spot*^[2], thesis for Audiovisual Realisation technical degree.

My connection with leather, the other material of interest for this thesis, does not come to me by luck. My mum always had this deep connection with this material; for her, leather was very valuable and special. Several of the objects that she owned and valued were made out of leather. I remember her favourite belt or that keychain of a scale model of Chukka shoe; a powerful amulet for her. I can imagine she would have loved the little Moroccan coin purse I found later and that I will talk about soon. I believe I have inherited from her that ability to give a special value to things that have their own voice.

^[1] Do it yourself pop-up book about Wes Anderson's cinematography style.

^[2] Planning of an advertisement spot creation about consumption of fruits and vegetables with the combined technique of stop motion and motion graphics.

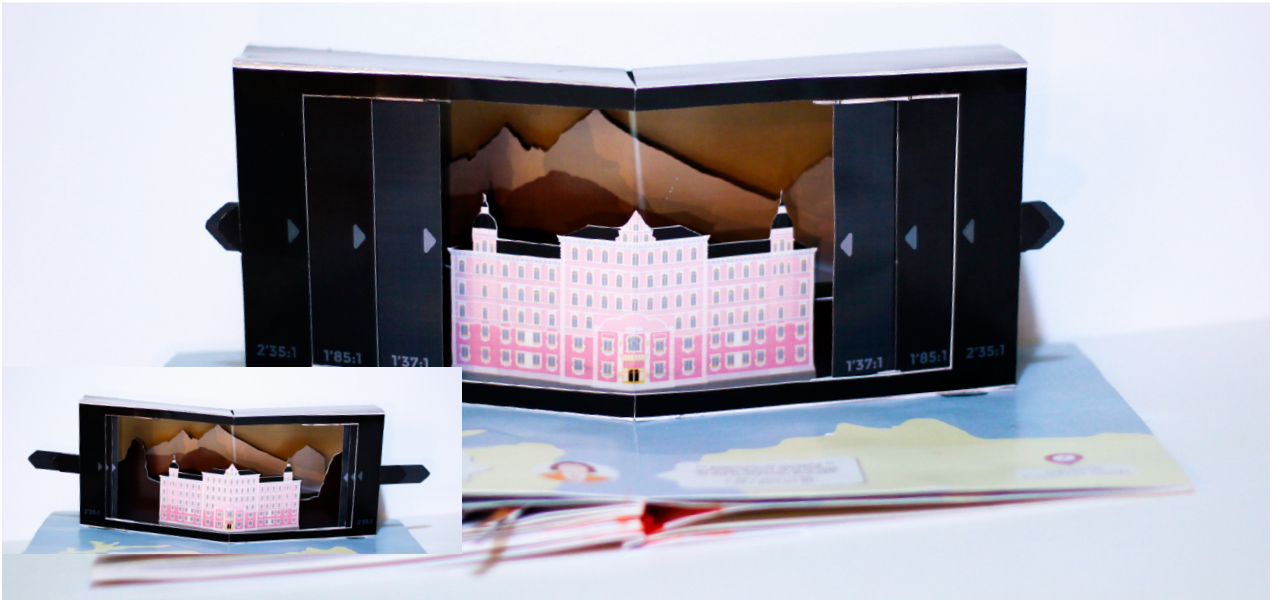


Fig 1: *Wes Anderson Pop-Up Book DIY 2018*^[3] ([Barranco](#)).

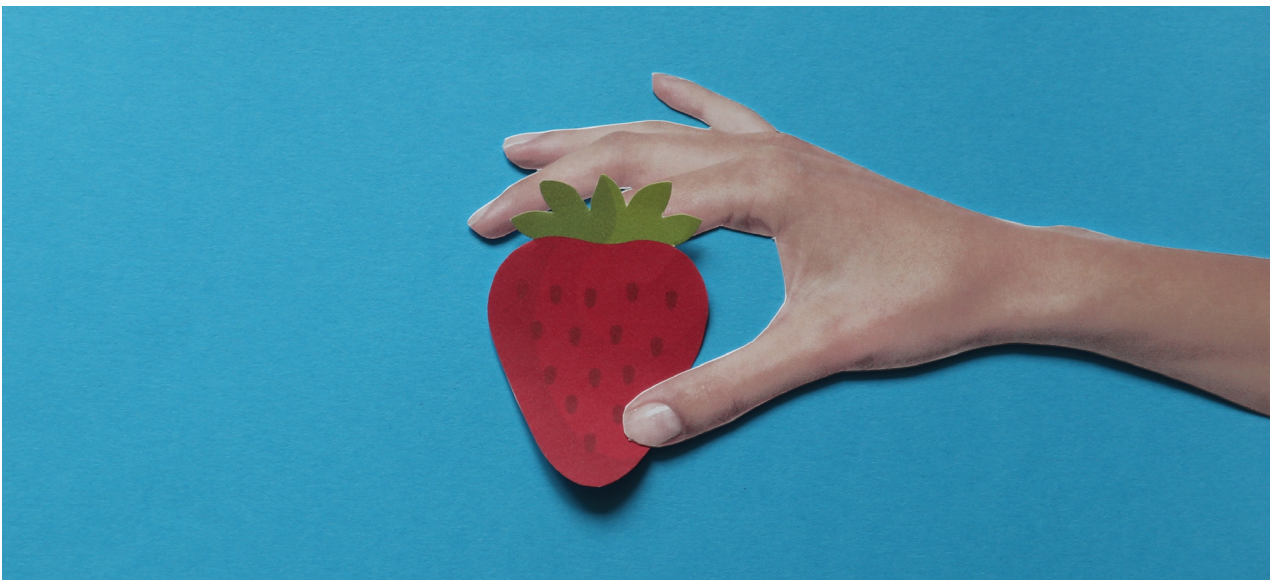


Fig 2: *Fruit and vegetables advertisement spot 2020* ([Barranco b](#)).

^[3] All the images are from the author, unless otherwise stated.

Everyday Objects

Dear reader, have you ever possessed an object that you really like? That you use recursively? That you miss when it gets lost or it breaks? For me it happens with everyday things.

I wake up with a cold nose and sit up in bed. I bend down and pick up a pair of woollen socks lying on the floor since the night before. Sliding them smoothly on my feet and feeling the friendly heat of my body maintained between the woolly fabric and the skin. They hug me, take care of me, protect me... I have had that garment for years. How would life have changed in its absence?

I grab my favourite breakfast mug off the shelf, pour coffee into it and mix it with a bit of milk. I hold the mug that fits perfectly in my hands while the ceramic warms my palms. I bring it to my mouth and take a sip of coffee. I like its texture, its colour, its shape, its size... It makes me feel good, calm. An extension of my body, a part of me. I appreciate its loyalty by keeping the coffee warm long enough for me to finish it. Contributing to my well-being, part of my daily ritual, I can't conceive mornings without it.

I take my notebook of ideas, open it and write several words with my old fountain pen. Some customised flaps stick out between its sheets as if it were a map where one can easily find their destination. I like the tone of its paper and the little dots printed that help me organise my thoughts. Somehow it reflects my being, clears my mind out of worries and reminds me of all my responsibilities. Looking for every small hole in which to finish writing what I have left; I wish I could go back in time and get the same faithful friend to fill with ideas over and over again. An endless notebook to use eternally.

I get ready for the start of the day. It's time to choose a dress for my feet. I remember those shoes that came to me spontaneously. Accompanying me on a thousand adventures, I wore them for years. Those shoes I always came to. Afraid to use them too much, fearing they would break. I never wanted to give them up. Missing their absence... Why can't they be forever?

I wonder, does this happen to others? So I asked friends and family, and the answers were very similar. The value of many of the objects they told me about was based on their relationship with a loved one ('it was my mother's'), on their connection with a good memory ('it reminded me of London' sun in spring, the smell of the books from the British Library, the pretty shops...') or on their materiality and durability ('The shades of blue from the stone when they meet the sun'). In addition, they also transmitted that these objects make them feel safe, comfortable, protected, loved, relaxed, at peace, at home, nostalgic, connected to their roots...

Some academics have tried to answer these questions. For example, the Colombian philosopher Adolfo León Grisales Vargas, in his article for *Thémata* magazine, elaborates that crafted objects make the human feel at home, safe and calm, and they act as an intermediary that helps the human to understand the reality of the world ([Grisales Vargas 2015](#)). As well as, the cognitive archaeologist, Lambros Malafouris when he talks about 'vital materialism' exposing that through things the human gives meaning to the world. Things bring people together, envelope their minds and become part of them ([Malafouris 2013: 44](#)).

During the last two years (2021, 2022) at my summer work^[4] I have seen several leather wallets that have caught my attention. And, although it has been a brief moment of conversation, from the little talk that I have been able to have with the owners of these objects we (both protagonists of the dialogue) have always concluded that these objects owe some kind of 'magic' that has accompanied them for years. I realised all have a personal and emotional value for them. They have always told me the story of those objects: 'a gift', 'I made it myself', 'A souvenir from a trip'... A shared story between the owner and the object. A story that they have saved in a little corner of their minds, a piece of the past.

^[4] Mountain Refuge keeper in a small village in the Spanish Pyrenees called Panticosa.

My mystic object

‘It was not as though I chose to study him, but rather that I was chosen for the job. It is as simple as that. However, looking back, I can see there were several preparatory stages leading to my fascination ...’

- Soetsu Yanagi^[5] ([Yanagi 2019: 106](#))

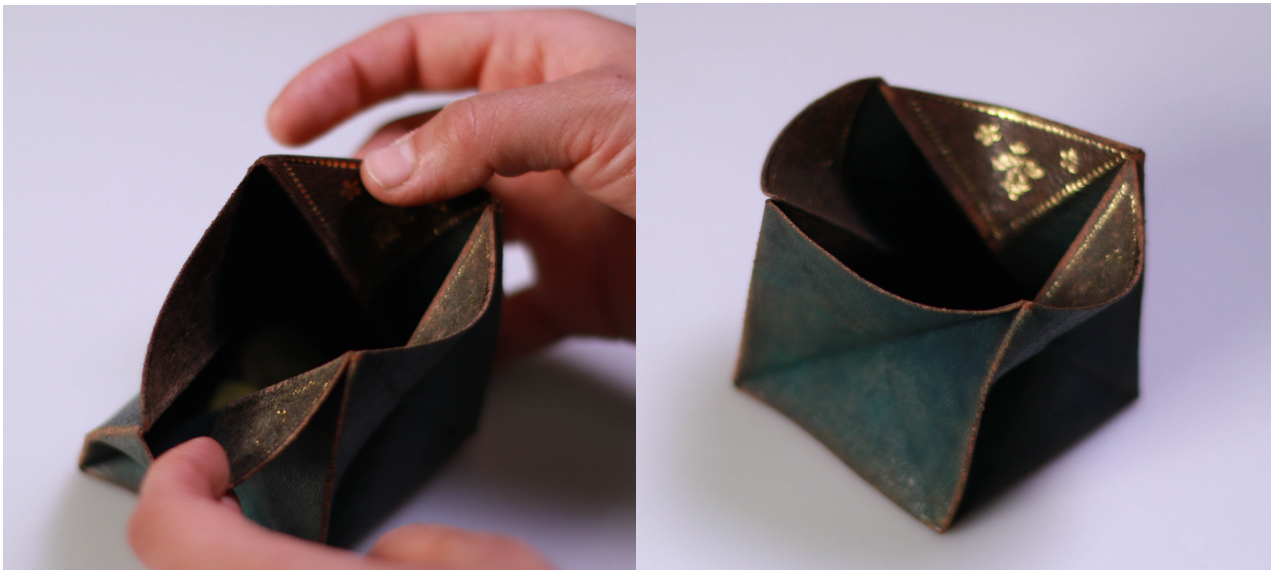


Fig 3: Moroccan coin purse.

In 2021, one particular item caught my attention. One client came to the bar and ordered some beers. He took his leather wallet and paid me in cash. I noticed the coin purse he took out of his pocket. I asked ‘Can I take a look?’ I explained to him I was studying accessory design and leather working and that I thought it was a very interesting item. I was about to take a picture of it when he, gladly, deposited the inside coins on the counter and gave me the purse. ‘Here you have, it’s yours.’ I insisted that it was his purse and I couldn’t keep it. He explained to me he bought some more during his trip to Morocco a long time ago and I should keep it. He had been using it for more than 10 years and it had been very practical for him but now it was time for somebody else to use it. I thanked him and went back to work.

^[5] Soetsu Yanagi was a Japanese philosopher, art historian, aesthete and poet who spent all his life searching for unusual objects made by unknown craftsmen and developed a theory about their beauty. He defended the Japanese folk crafts movement and helped establish the *Japan Folk Crafts Museum*.

A while later, I examined the object and I realised how the object was made. In this case, leather was treated as paper. Small pieces of extra thin leather glued together forming two layers and folded with a twist in order to close the purse and prevent the coins on its inside to escape. What a mysterious and mystic object, I thought. A mix between leather and paper, art and science, magic and practicality.

My intrigue over this item led me to wonder why I perceived it differently. So I started to question it.

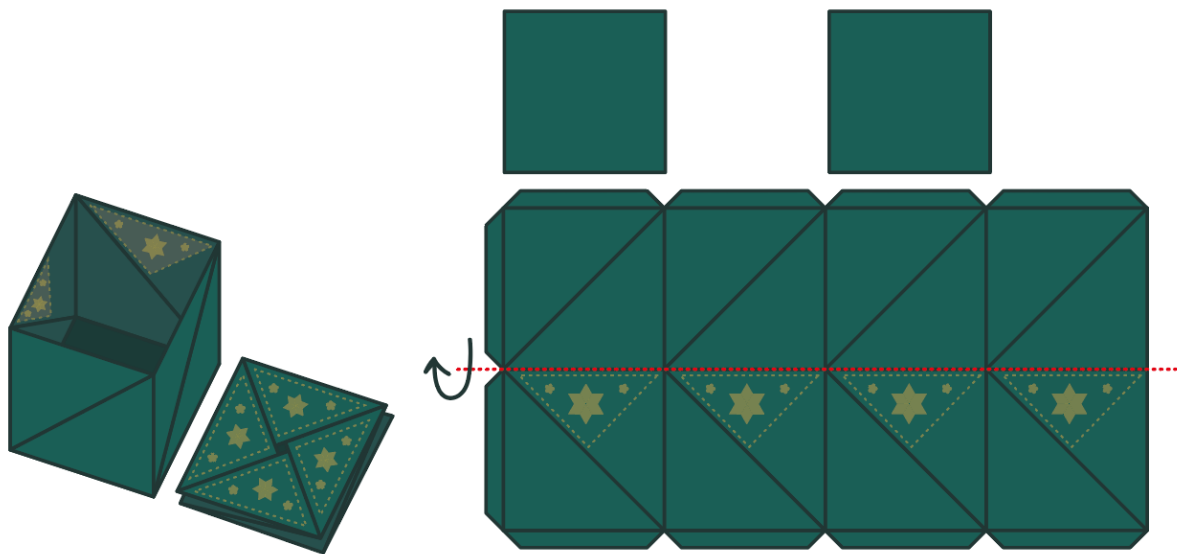


Fig 4: First dissection and analysis of the object.

ANALYSING MY OBJECT

Natural mysticism

What is that inexplicable ‘thing’ that makes the object call my senses, to feel its magic?

I have referred to this object as mystical, although perhaps not in the full definition of the word which is commonly related to religion. However when it is used as an adjective, its definition changes: ‘relating to magic or having magic powers, especially of a secret, dark, or mysterious kind.’ ([Cambridge Dictionary](#)), ‘mysterious, full of mystery’, ‘hidden from or obscure to human knowledge or comprehension.’ ([Online Etymology Dictionary](#)). So, could a mystic object be defined as something with an ‘inexplicable magic’ that escapes reason? Michael Hulin, the French philosopher, talks about ‘wild mysticism’; a non-religious philosophical branch, related to a sudden feeling of spiritual communion with nature triggered by a childhood memory or the use of narcotics ([Hulin 1993](#)). Here it’s seen a latent connection with the natural world. Some kind of magic bond? An irrational connection with nature?

Antonio Gaudí, the Spanish architect and artist, applied this in his practice and suggested everybody must read ‘The Book of Nature’ because all the other books have been extracted from it by man, that’s why they contain human interpretations and errors ([Boada 1981](#)). Cézanne, the famous French painter, spent his whole life in search of nature’s expression through colour in painting. He defended that the only way to express colours, textures, sensations... was through nature. Beauty in Cézanne’s paintings is the consequence of nature’s expression ([Merleau-Ponty 1945: 13](#)). But how can the object be a reflection of nature? The political theorist Jane Bennett talks about ‘vital materialism’ suggesting that the material is alive ([Bennett 2009: 52, 60](#)) and points out its intimate connection with the craftsperson. An emotional and tactile connection with the material is also reflected in the practice of the contemporary artists Maarit [Mäkelä](#) and Nithikul [Nimkulrat](#). The last artist, especially in her work with paper, mirrors my thoughts through the material. When the human becomes part of the material, or, when the artist becomes part of her work ([Nimkulrat: 3](#)).

‘The most important thing is to breathe life into the paper.’ - Eric Joisel, French origami artist ([Gould 2008: 9](#)).

The material takes value in itself when it’s treated as a partner. Only then, it shows its splendour, its natural beauty and the hand of the craftsperson becomes the hand of nature ([Yanagi 2019: 1](#)). In this sense, the craftsperson becomes the interpreter of nature and exhibits it to the world, to the others through art, crafts, design, science...

Are crafts the narrative of nature in contact with the human intellect?

Human interpretation

What is that ‘thing’ that makes the object call my intellect?

In the previous paragraph, I have spoken of an intimate connection with nature more related to intuition^[6] or material intuition. For Soetsu ‘intuition is a direct insight into an object’s essential nature’. He divides two ways of perceiving an object: intuition and intellect ([Yanagi 2019: 60](#)). Cezanne defended that art is a personal perception of the world (nature) embodied in sensations and asks his understanding (intellect) to organise it into painting ([Merleau-Ponty 1945: 13](#)). Something similar to the idea of the ‘intelligent hand’; the link between the touch and the intellect ([Sennett 2009: 149](#)). The connection between nature, the hand and the intellect is something very related to origami^[7]. Kunihiro Kasahara, the Japanese origami artist, refers to it as a transition from ‘a lyrical handicraft to an intellectual hobby’ ([Kasahara 1988: 24](#)). Something between arts and science. As Cezanne expressed, nature is the base on which humans conduct their sciences ([Merleau-Ponty 1945: 13](#)). And it’s that, many folding patterns are present in nature: mountains, valleys, tree leaves, flowers, DNA... ([Gould 2008](#)).



Fig 5: *Sedimentary fold*. José Barranco Arroyo, 2017 (Pecico’s Lakes, Panticosa, Spain).

^[6] Intuition (noun): ‘an ability to understand or know something immediately based on your feelings rather than facts’ ([Cambridge Dictionary](#)).

^[7] ‘Origami’ is the Japanese art of paper-folding based on the successive combination of V (valley) and M (mountain) folds in a certain order to create two-dimensional and three-dimensional figures ([Robinson](#)).

In the latter part of the 20th century origami has been explored in a wide variety of fields ([Lang 2017: XV](#)) and has given rise to many practical applications in engineering, space, nanotechnology, medicine, biology, design... ([Gould 2008: 50'](#)). The technique of folding is purely mathematical and a good example are the so-called 'origami tessellations'; a geometrical origami type formed from small units that creates a repetitive or modular pattern ([Lang 2017: XV, XIV](#)). Origami allows the simple explanation and understanding of many geometrical concepts: dimensions, figures, angles, vertices, edges... For example, Friedrich Froebel, a German educator that helped to spread paper folding around the world named the folds in three different groups; Folds of Life, Folds of Truth and Folds of Beauty depending on the level of difficulty and shape ([Lister b](#)) ([Robinson](#)). That's why origami it's not a simple recreational activity but an educational tool as well ([Gould 2008: 39'](#)). From a piece of plain paper to a 3D figure with the exclusive intervention of a pair of hands^[8]. Again Sennet and the hand connected to the intellect. By folding, the mind through hands discovers and understands the world. According to Malafouris in his theory MET^[9], things constitute our ways of making sense of the world ([Malafouris 2013: 44](#)).



Fig 6: *Twisted Pouffes*. Sigrid Barranco Ballonga. 2022 (Documentation Center for Water and the Environment, Zaragoza, Spain).

‘I use mathematical and geometrical ideas to achieve this goal of a beautiful form and shape.’ - Robert J. Lang, physicist and origami theorist ([Gould 2008: 14'](#))

^[8] Despite popular belief not all the origami is based on the principle of no cutting or no glueing, although a vast majority are.

^[9] *Material Engagement Theory* (MET). Lambros Malafouris investigates materiality of things in relation with human cognition.

I think this phrase sums up everything expressed above. The use of geometry and its connection with forms and natural laws results in something that feeds the human intellect and pleases his/her senses. This idea is connected to Yanagi's philosophy when he talks about patterns. Patterns are, so, a human interpretation of nature and defends that the beauty of a pattern depends on its ability to free the imagination of those who contemplate it ([Yanagi 2019: 59, 74](#)). Even though Yanagi talks about Japanese graphic motifs found in vessels, tea cups, textiles... could it be also translated into origami patterns?

‘My origami creations, in accordance with the laws of nature, require the use of geometry, science, and physics. They also encompass religion, philosophy, and biochemistry. Overall, I want you to discover the joy of creation by your own hand... the possibility of creation from paper is infinite.’

- Akira Yoshizawa ([Lang](#))

Robert J. Lang, as well as, the IT professor and origami engineer Eric Demaine and many other origami artists, express the process of creating figures out of paper as ‘magic’ because of the impressive capacity of paper's expression^[10] even with minimal and simple folds ([Gould 2008: 4, 45](#)). Almost as if the ‘fold’ wanted to tell its own story.

^[10] Something similar to the concept of ‘material imagination’ that the Estonian philosopher Erik Hermann exposes in his text *How To Make Concepts With Hands: Towards Material Imagination* ([Hermann 38](#)).

A story of time

What is that ‘thing’ that makes the object tell its story?

As I already expressed, my mum always had this deep connection with materials and objects. She could feel the different vibrations of ancient objects; of objects with story. Probably that comes from my grandfather too, he used to save and categorise ordinary objects in boxes, sometimes cigar cases, and save them into drawers. Everything was meticulously arranged and classified. Since I remember, a restored old dark wooden trunk from the 18th century has been part of our house, which my mum used for storing the winter clothes during summer and the summer clothes during winter. Resting inside the trunk there was a thick carpet with Indian motifs she always took out for winter using it as a protective shield against the cold coming from the floor. She had a predilection for handcrafted objects with a certain mysticism and voice. And I can’t escape this fate either. That’s why, when I encountered the Moroccan coin purse, I felt that it possessed something special. Something as if the object was talking to me and wanted to tell me its story. Without any clue of it, except its Moroccan origin, that object captured me. That’s why I felt very identified when I read Yanagi’s words about his encounters with anonymous ‘unsealed’ objects (as he designates them) ([Yanagi 2019: 169, 186](#)). That expressive capacity of the object that mirrors ‘what it is’ without being explicit. For me that ‘unknown’ is mysticism and I believe for Yanagi is ‘beauty’^[11].

‘This attraction... was the result of simply looking at things directly, seeing them as they are... buttressed by the simple process of seeing with one’s own eyes before dissecting with the intellect. We would like, we thought, to share the joy this brought us. Through the medium of everyday objects we would like to tell the story of the now forgotten beauty of the past.’ - Soetsu Yanagi ([Yanagi 2019: 227](#))

For Yanagi the beauty of a utilitarian object grows with time, the more they are used the more beautiful they become ([Yanagi 2019: 36](#)). Luckily, during the Christmas break, I had the pleasure of observing a similar coin purse my aunt had at home; this time it hadn’t been used. And I can say this ‘mysticism’ I’ve been talking about wasn’t completely there. I do not know if it was because it didn’t take me by surprise or because its story wasn’t written yet. However, I would like to twist towards the second thought since, in my Moroccan artefact, the passage of time it’s visible on its surface. In this way, the material acquires voice and tells its own story ([Mäkelä 2022: 28](#)). A mix between the concept of ‘materialness’^[12], proposed by Nimkulrat, in relation to time.

^[11] I prefer the world mysticism instead because I consider the concept of beauty is very wide and can be misunderstood as only aesthetic beauty.

^[12] ‘Materialness’ consists of the ability of a specific material (physical form and matter) to express or signify something to its creator or audience ([Nimkulrat: 9](#)) ([Nimkulrat 2009: 13](#)).

In some way, the object reflects its past, its adventures, the hands it has passed through, the coins it has contained, the cultures it has known... In summary, it becomes the reflection of nature, humans and time.

‘And so origami exists amidst nature, time and human community.’

- Florian Aicher ([Fuse 2021: 335](#))

For this reason, Glenn Adamson, the American author, defends that a good object contains thousands of years of experience and knowledge. That’s what he calls ‘material intelligence’; that life’s everyday objects embody and makes the human empathise with tangible things as well as, consequently, with other humans and the surrounding environment (nature)^[13]. However, the challenge is to read those stories ([Adamson 2018: Introduction](#)).



Fig 7: *Indian motifs Carpet.* Sigrid Barranco Ballonga. 2023.

^[13] For UNESCO (United Nations Educational, Scientific and Cultural Organization), crafts are a main tool for sustainable development ([Etienne-Nugue 2009: 50](#)).

The origin of the object

What is the story of my mystic object?

I can't express with words what is the story of the Moroccan coin purse, however, I can try to present its history or origin. In this case, its origin was almost unknown and although, so far, it has not been so important in its story, it has also been part of it. Therefore, and although it is incomplete, I would like to share a few hints I found about the origin of this mysterious object that, in some way, closes a circle in this reflection.

The **first clue** is related to the designation of leatherwork in Spanish: *marroquinería*. The word comes from the term *marroquí* which translates as Moroccan in addition to being a very thin burnished and lustrous leather^[14]. Similar is the term *cordobán*^[15]: tanned calfskin decorated with reliefs and painted with gilded designs and the term *brocaded guadamecí*^[16] that is artistically carved leather with a golden or silver surface. Thin leather and golden motifs that resemble the details of my mysterious Moroccan object and suggest its roots.

The **second clue** comes from Japan. In 1988 Kunihiko Kasahara published a book called *Origami Omnibus: Paper Folding for Everybody* where he includes a collection of 'discoveries and viewpoints of outstanding mathematically-minded origami researchers' among which are Kōji and Mizué Fushimi. This Japanese couple is responsible for the so-called *Tatō* fold (**Fig 8**) ([Kasahara 1988: 24](#)) which curiously is very similar to the one in the Moroccan coin purse. It might be a coincidence of different thoughts in different places or a crossing of cultures like Thor's *Ra Expeditions* adventure across the Atlantic Ocean^[17] in a papyrus boat (**Fig 9**) ([Heyerdahl 1972](#)). Although the cause of its origin is not very relevant, I like to think about that surrounding mysticism that travels through time and culture.

The **third clue**, and the last, is related to the origins of papermaking in Occident. The Arabs learnt how to make paper from Chinese prisoners in Samarkand around 751 c.e during the Arab conquest ([Hannawi 2012: 19](#)) ([Hunter 1943: 139](#)). Despite popular belief, there is no proof that the Arabs

^[14] Moroccan artisans used to be the most skilled at working leather. This type of leather is also denominated as *tafilete*, named after a region in the southeast of Morocco where these leathers were prepared ([Real Academia Española](#)).

^[15] *Cordobán* (*cordwain*) comes from Córdoba, due to the great development that leather tanning reached in this Spanish city under the Muslim rule ([Online Etymology Dictionary](#)).

^[16] *Guadamecí* it's variant of *gadamesí*, in Andalusian Arabic *ḡadamisí*; the inhabitants of the city called Gadamés famous for its tanners, leather goods workers and saddlers specialised besides of their characteristic decorated leathers and brocades ([Real Academia Española](#)).

^[17] Thor Heyerdahl, in the 70's, crossed the Atlantic Ocean in a papyrus reed boat trying to prove that Egyptians might have arrived in America since similar boats were found in the Peruvian tradition as well as in the African.

were taught origami technique during this period or that Moorish architecture^[18] was inspired by it. However, figural representations were prohibited in the early period of Islām that's why much of the Moorish art is based on geometrical forms as well; in concrete its mosaic patterns^[19]. This type of tile (lat. *tessera*) art is called 'tessellation' and it consists in the repetition of a motif forming a pattern with no spaces in between. The so-called 'origami tessellations' are based on the same principle too. According to The British Origami Society, the Japanese Shuzo Fujimoto was the pioneer of one-piece origami tessellations with his book *Twist Origami* (1976) ([Fujimoto](#)). Many other artists have found inspiration in these types of motifs during their trips to Granada (**Fig 10**). It is the case of the Dutch artist M.C. Escher considered the 'father of modern tessellations' ([Britannica](#)) (**Fig 11**) or the origami artist Chris Palmer who has been the promoter and developer of 'origami tessellations' for the past 3 decades^[20] ([Lister](#)) ([D. Demaine: 1](#)).

It would have been great to be able to find more information regarding the origin of the object but in some way or another, all the tracks find their connection. It's clear someone knew how to take advantage of the qualities of a material (leather) by applying a technique (folding) and obtaining an extraordinary utilitarian object. That's why, when this item came across my path, exploring it further was indisputable, so this practice is mainly focused on similar twists, patterns and, somehow, technique.

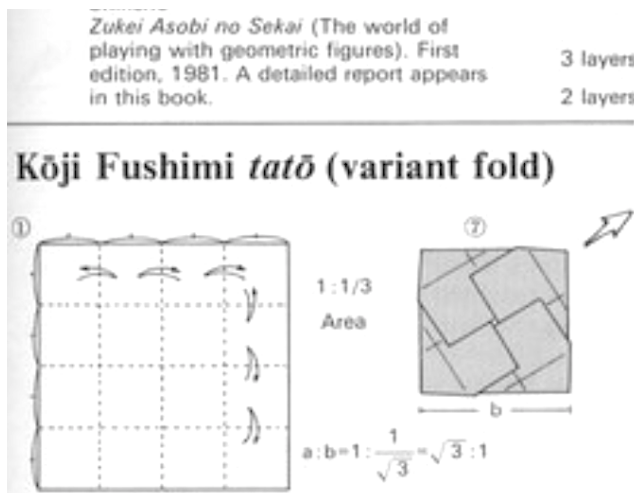


Fig 8: *Kōji Fushimi Tatō*, Kunihiko Kasahara variant fold ([Kasahara 1988: 24](#)).

Fig 9: *Ra II*, from Morocco to Barbados ([The Kon-Tiki Museum](#)).

^[18] Usually referred to the muslim-ruled area of the Iberian Peninsula: Al-Andalus (711 - 1492 c.e).

^[19] In the Maghrib and the Iberian Peninsula tile mosaic is named as *ziliġ* ([M. Bloom 2020: 270](#)).

^[20] In 2011 Chris published a book called *Shadowfolds* based on his research of paperfolding techniques of Shuzo Fujimoto and inspiration of tilings that he studied at the *Alhambra* (Granada, Spain) ([K.Palmer, Rutzky](#)).



Fig 10: Tiles from *Alhambra* in Granada ([Area25](#)).



Fig 11: *Triangle system IB (3) type 1*, M.C. Escher. ([M.C. Escher Foundation](#)).



Fig 12: Origami Tessellation Leather sample. *Intersecting Cylinders - Gear*. Roman Remme ([Remme](#)).



Fig 13: Leather sample. *Hex Spiral Tessellation*. Kendrick Feller. ([Ghassaei](#)).

THE JOURNEY OF THE FOLD

Fascinated by the Moroccan artefact, the main objective of this practice has been to recreate its interlacing technique (leather origami) to expand its possibilities. As Nimkulrat proposes, to bring a new perspective toward the material and the technique will emerge ([Nimkulrat: 4](#)). The aim is not to create a product, rather it is to focus on the evolving process and reflect on it ([Mäkelä: 28](#)).

Dialogue with nature

The practice arises from the Moroccan coin purse. That is why the first phase is strictly related to its shape. This preliminary phase consists of first knowing, experimenting and studying the folding pattern of the object (**Fig 11, 12**). In this case, the materiality is left aside and the fold takes centre stage. The objective of this phase is to discover the fold in the environment with the natural world and reflect on this dialogue between the fold and the external agents. Therefore, for this purpose, it is given voice to the fold that articulates, in the first person, its affairs. The craftsperson finds expression through the fold's narrative and decodes it. Nimkulrat expresses this concept well when she claims 'I became the work I was working on' ([Nimkulrat: 5](#)). I became the fold. And by doing that I could understand it better.

The result of this internal dialogue is represented as audiovisual poetic content in a monologue where the fold voices itself in the first person.

This preliminary experimentation phase, primarily carried out on paper, places the fold in different situations and exposes it to elemental agents; light, air and fire, that interact with it in this concrete shape. First, the fold meets the light modelling its incorporeal shape. Next, the fold meets the air, losing its static form by letting the air play with it. And, finally, the fold meets the heat that releases its bonds with the material and lets the twist free. The end of this process means leaving behind the fold as something more passive (that must be observed) by giving rise to something more dynamic (that must be interacted with). It symbolises the transition from paper to leather in this practice.

Folding Leather; Video Part I: from 00' 00" to 05' 13" .

<https://youtu.be/OhlJQZV3soQ>

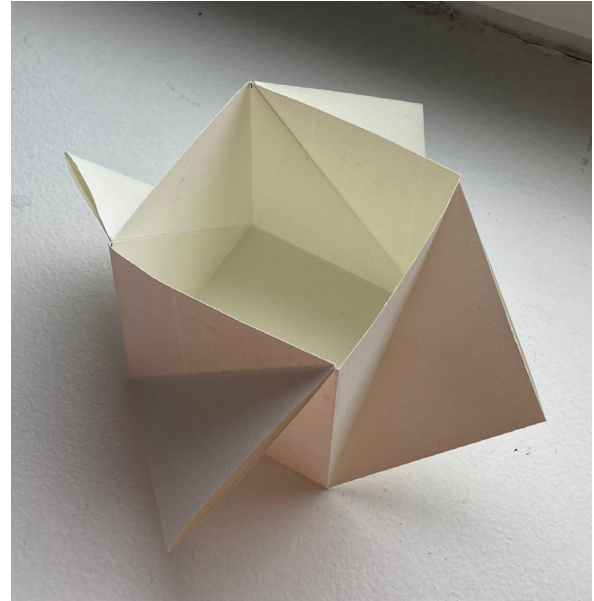
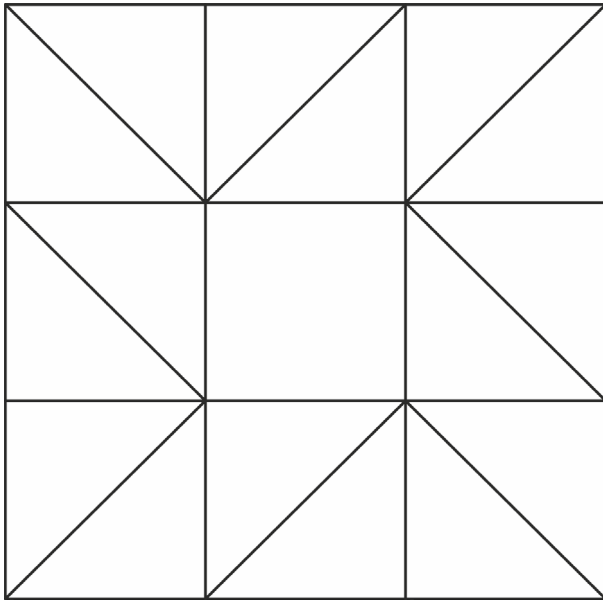


Fig 14: Moroccan coin purse origami pattern and half folded shape.



Fig 15: *Folding Leather* Video Part I. Screenshot.

Dialogue of matter and shape

As it has been already expressed, the first part of the experimentation is based on a more closed process of reflection and passive knowledge where the human spectator has the role of observer. Nevertheless, the transfer of artistic objects from paper to leather, in this context, signals the change from admirer to collaborator. It is the example of the *Tatō* fold on paper; it becomes an interesting concept that you can carefully touch and observe. In this case, is not the object itself but the creation of it that allows the maker to engage with the process and think through it. However, when the same principle (the same fold) is transferred into leather it acquires an active agency and invites the human spectator to interact with it; to play with its shape, to understand its mechanism repeatedly, to explore its material properties... One way or another, to understand its world and nature. The human being acquires an active and intellectual role in the use of it ([Kasahara 1988: 24](#)). A matter of tactile knowledge. The hand connected to the intellect ([Sennett 2009: 149](#)). So the human being, not anymore a spectator, takes the place of the craftsman.

In the second part of the experimentation, the fold also reflects on its new nature and affairs in its contact with a pair of thinking hands; the human being. A haptic experience of collaboration between human and nonhuman interactions.

Folding Leather; Video Part II: from 05'13" to 07'00".

<https://youtu.be/OhlJQZV3soQ>

During this journey, the fold embodied in different skins (leather, parchment and bonded leather) expresses its shape in several ways (squares, spirals and twists). This process gives rise to a set of experiments in which reflection on and learning through practice takes place. These experiments are based on existing origami patterns by Ekaterina Lukasheva, Jun Mitani, Chris K. Palmer, Jeremy Shafer, Kendrick Feller and Roman Remme. ([See Technique in "ANNEX 1"](#)) ([See Experiments Catalogue in "ANNEX 2"](#)).



Fig 16: Leather purse experiment.

Rematerialisation

‘The craftsperson needs to learn how to listen to the voice of the material to have a productive and fruitful dialogue with it.’- Maarit Mäkelä ([Mäkelä: 22](#))

In this stage the resurface of a new skin means a big change. The fold, attracted by its resemblance with paper^[21], it’s materialised in parchment and rawhide^[22] and, soon, it feels ruled by the material laws and forces: drying and shrinking. The fold finds its way when wet but struggles to keep its truth while drying. For that reason, with the help of the intelligent hand, by controlling the moistness^[23], pressure and the use of external help^[24], the fold manages to maintain its shape (**Fig 17, 18, 19**). The fold experiences the new medium and accepts its rigid and static nature.



Fig 17: Parchment sample. *Eye of Storm*. Ekaterina Lukasheva. ([Lukasheva 2021: 110](#)).

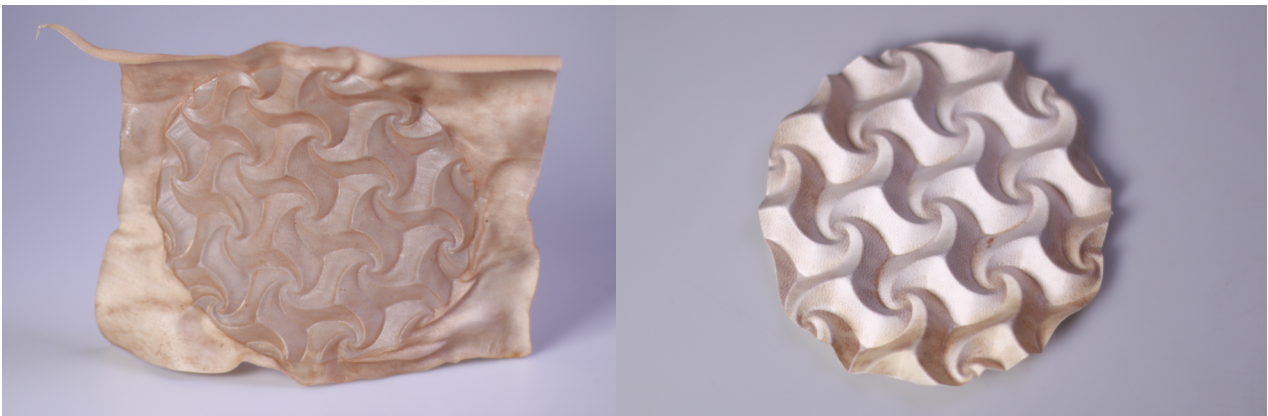


Fig 18: Parchment (cow and goat) samples. *Hex Spiral Tessellation*. Kendrick Feller. ([Ghassaei](#)).

^[21] Historically used for the same purpose: text writing.

^[22] Treated skin before being stretched and dried for parchment.

^[23] With a mix of water and alcohol.

^[24] Stretching nails.



Fig 19: Rawhide sample. *Hex Spiral Tessellation*. Kendrick Feller. ([Ghassaei](#)).

Jumping from the ancient to the modern, the transition from parchment to bonded leather^[25] relives the fold. Its composition does not admit much moistness in and it dries fast, which forces the fold to bend quickly. Even with the help of the intelligent hand its shape becomes weak, flimsy and tends to disappear^[26] (**Fig 22**). Nevertheless, its bouncy nature suggests certain playfulness.

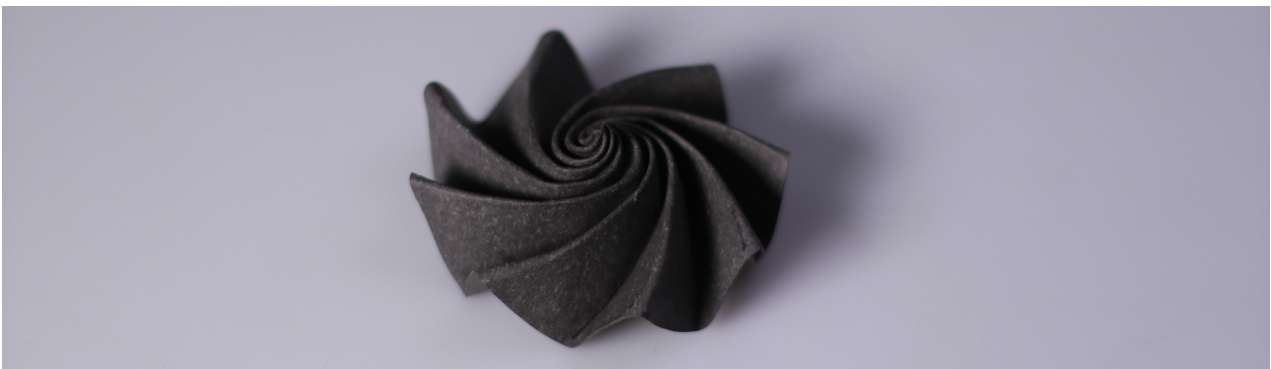


Fig 20: Salpa sample. *Eye of Storm*. Ekaterina Lukasheva. ([Lukasheva 2021: 110](#)).



Fig 21: Salpa sample. *Hex Spiral Tessellation*. Kendrick Feller. ([Ghassaei](#)).

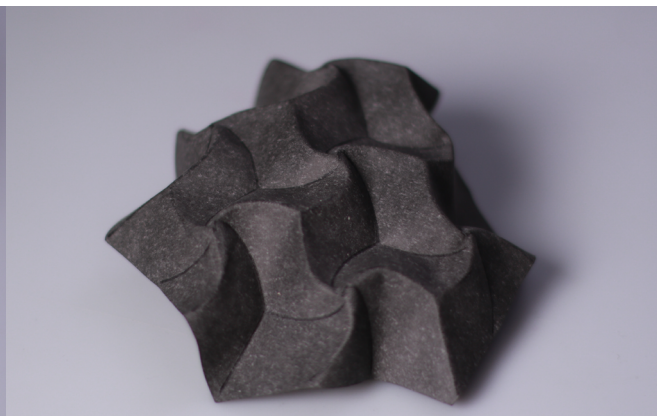


Fig 22: Salpa sample. *Triton-A*. Ekaterina Lukasheva. ([Lukasheva 2021: 124](#)).

^[25] Leather fibre fabric also called Salpa.

^[26] Its edges do not stay defined and its shape tends to open.

Looking for a middle ground, the fold tries one last material: leather^[27]. The fold acquires rigidity and flexibility at the same time. Its contact with water and pressure hardens its walls and makes the fold free to choose its stable shape by controlling its bending angle^[28]. However, its modelling releases the folding tension and allows the intelligent hand to play with its dry shape.



Fig 23: Leather sample. *Hex Spiral Tessellation*. Kendrick Feller. ([Ghassaei](#)).

During the modelling process, the dialogue between the intelligent hand, the fold and the material becomes essential. This activity, especially with complex patterns, can be comparable to a rhythmic symphony^[29] evolving the three parts. The hand meets the fold over and over until the material acquires the form and dries. The craftsperson imagines her design and tries to reproduce it within the material. At this moment, the craftsperson maintains a dialogue through the fold with the material that becomes a reflective activity ([Mäkelä: 14](#)). When the result does not turn out as the mind expected (**Fig 24**) the nature tells its truth, and the craftsperson must listen and adapt to take this new opportunity of exploring and learning ([Bennett 2009: 52, 60](#)) ([Hermann: 32, 33](#))^[30].



Fig 24: Failed experiments resulting from lack of experience, knowledge, reasoning or previous testing.

^[27] Thin vegetable tanned goat leather (1,5mm).

^[28] Depending on the bending angle in which the piece dries its shape changes; more open or more closed.

^[29] The ceramic artist Priska Falin compares the process of clay 3D printing with a music score in her publication *Practitioners' Experience in Clay 3D Printing: Metaphorical viewing for gaining embodied understanding* ([Falin](#)).

^[30] As Erik [Hermann](#) exposes in his text *How To Make Concepts With Hands* that 'difficult' materials have their own patterns of behaviour and, in this case, experimentation plays a major role in their cooperation with the craftsman.

Transformation

In parallel, the fold suffers transformation. First, it finds small variations in its original shape; a square that closes itself with a twist. The fold, still shy, only lets the intelligent hand transform it^[31] (Fig 25). In some cases, the minimal help of sewing, glueing or attachments, keeps the fold's shape in place (Fig 26, 27, 28). In other cases, benefited from the material properties^[32], it finds itself a new way to be (Fig 27, 29).

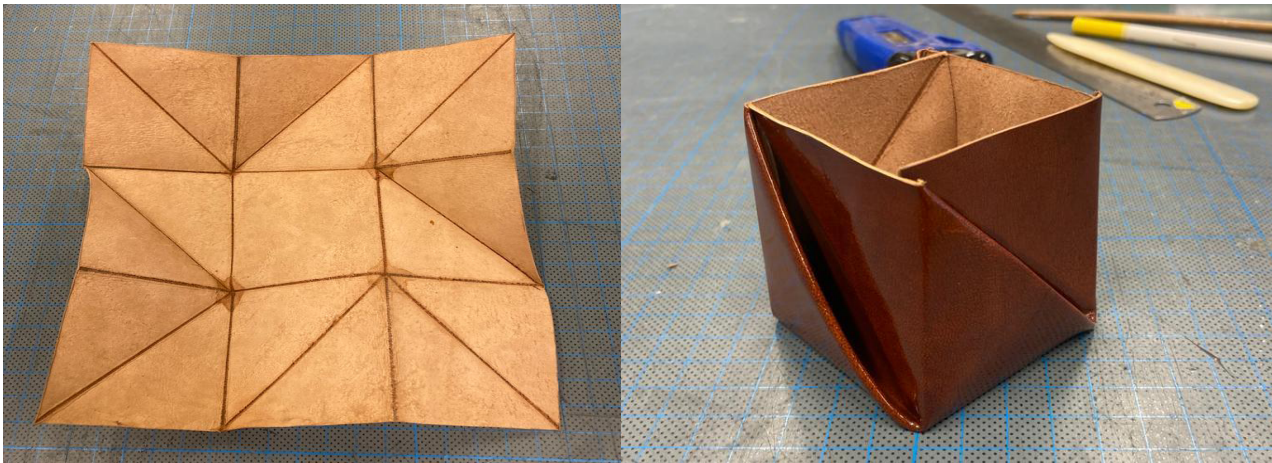


Fig 25: Moroccan purse box from one piece of leather.



Fig 26: Leather purse experiment.

^[31] The folding lines in these experiments are mainly drawn by hand with the help of some external tools such as a bone folder, ruler and cardboard patterns...

^[32] Leather shaping and modelling.

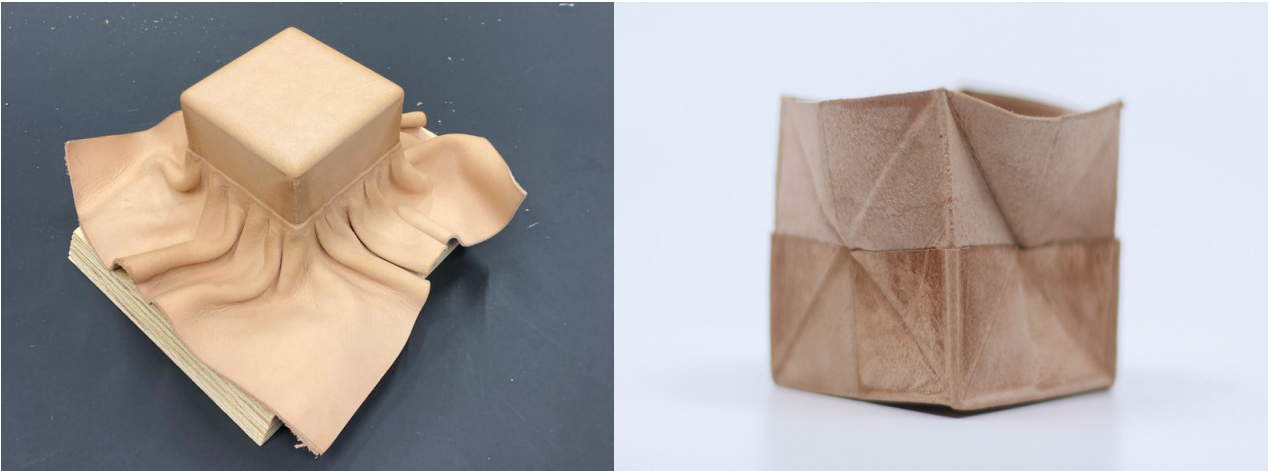


Fig 27: Moroccan purse from half square of moulded leather + glued inner wall.

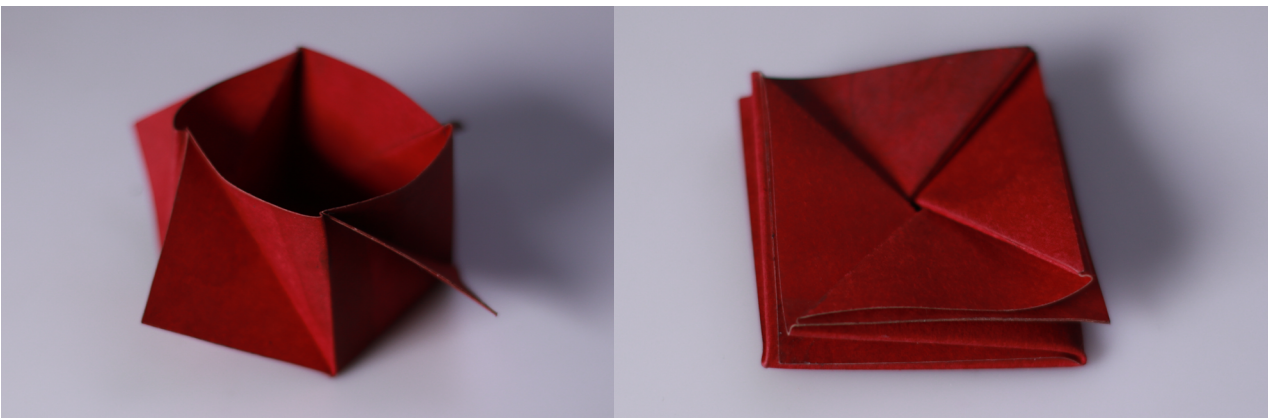


Fig 28: Moroccan purse from one piece of salpa.

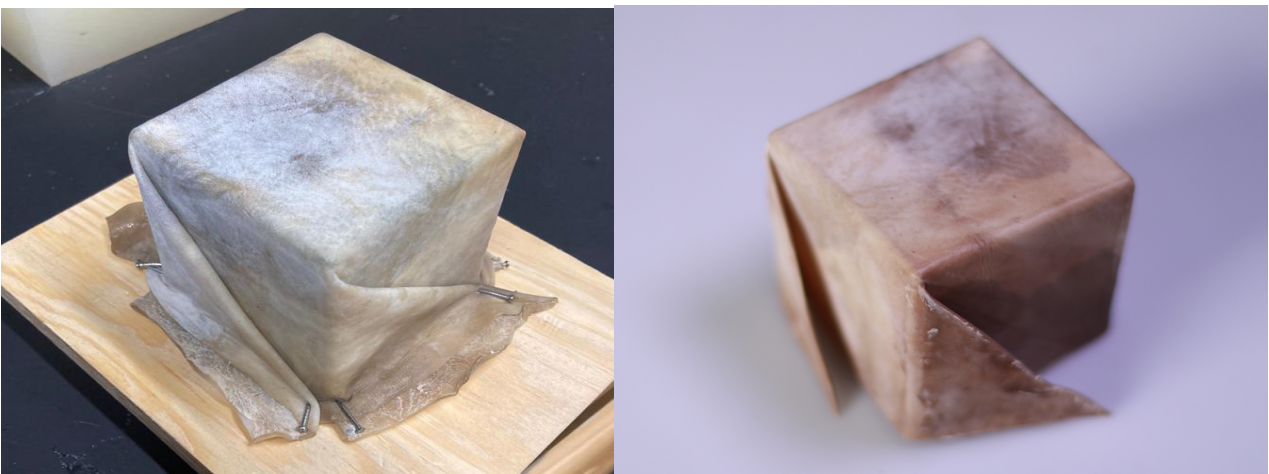


Fig 29: Rawhide square test sample.

Then, the fold embraces nature and forfeits its linearity; bends in a curve experiencing the ‘miracle spiral’^[33]. The fold flows in different circular patterns^[34] from which twists emerge (Lukasheva 2021). These experiments become a place of reflection that helps the intelligent hand to internalise the process and understand its unfamiliar complexity (Falín: 9). In this case, the fold, confident enough, lets the pressure draw its mountains and valleys and entrusts its modelling to the intelligent hand which ensures its shape^[35].



Fig 30: Leather sample. *Eye of Storm*. Ekaterina Lukasheva. (Lukasheva 2021: 110).

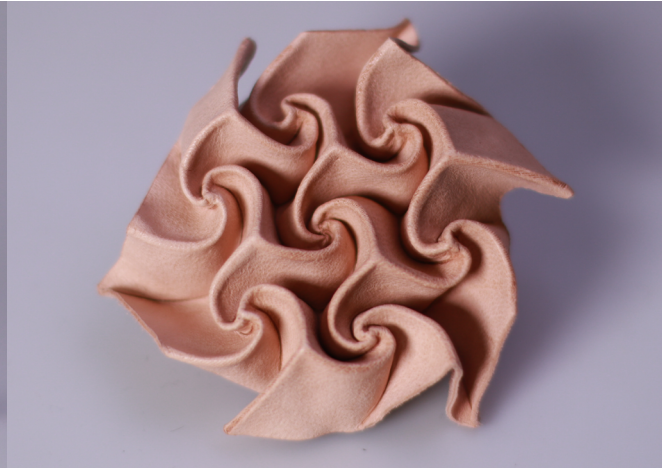


Fig 31: Leather sample. *Triton-A*. Ekaterina Lukasheva. (Lukasheva 2021: 124).



Fig 32: Leather sample. Variant of *Triton-A* (Fig 31).

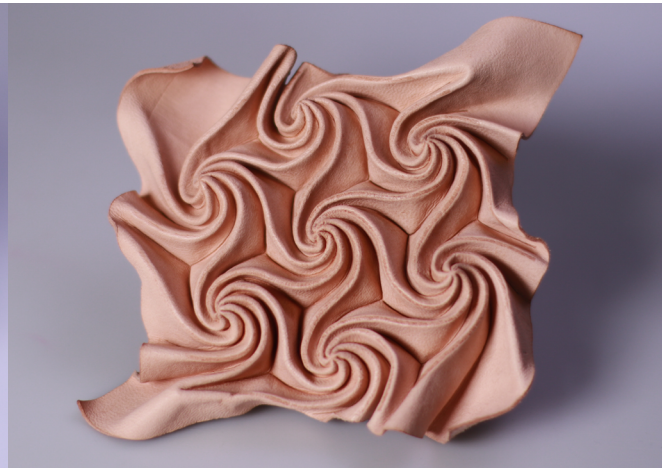


Fig 33: Leather sample. *Energy-A*. Ekaterina Lukasheva. (Lukasheva 2021: 127).

^[33] Referred to as the logarithmic spiral and named by the Swiss mathematician Jakob Bernoulli, this curve is observed in nature in spiderwebs, large shells and certain flowers (Britannica).

^[34] These repetitive patterns follow the same principle as the artworks of M.C. Escher; based on geometric grids to form intricate interlocking designs and natural inspired forms (Britannica).

^[35] The piece of material is wet and cold pressed, in order to get the pattern's print. The creation of embossed moulds is essential in this process. Once pressed, the wet piece must be hand modelled in order to create the folded shape.

Folding Leather



Fig 34: *The Spiral Aloe plant's geometry*^[36] ([joeChump](#)).



Fig 35: *Development II*. February 1939. Woodcut. - M.C. Escher ([M.C. Escher Foundation](#)).



Fig 36: Leather sample. *Intersecting Cylinders - Gear*. Roman Remme. ([Remme](#)).

Tessellation pattern from squares and triangle vaults. This leather sample varies (reduces its volume) from the original paper model and recalls the Moorish mosaics already mentioned.

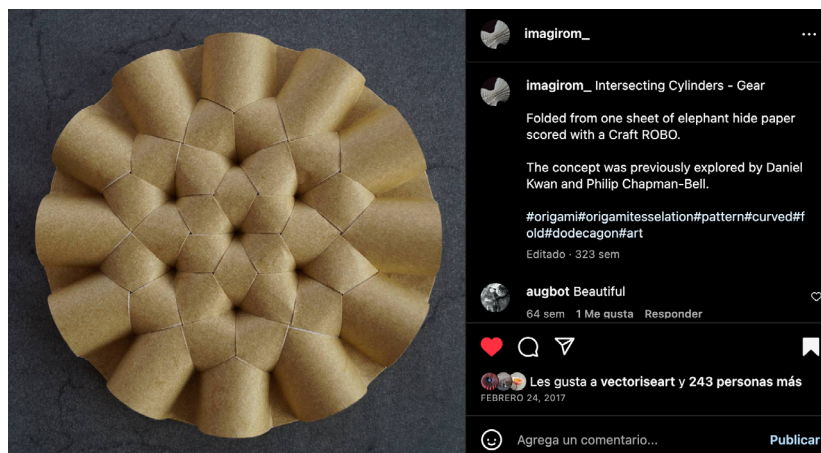


Fig 37: *Intersecting Cylinders - Gear*. Roman Remme ([Remme](#)).

^[36] 'Phyllotaxis' is a botanical phenomenon in which whorls, petals, branches, leaves... are arranged in a fibonacci's sequence or fractals ([Britannica](#)).

Finally, the fold begins to think. It comes back to the smaller units and simple shapes experiencing polygon twists. The fold gets carried away. The intelligent hand, through tactile manipulation and reasoning, feels and deduces the fold's journey to become a shape. From a mountain peak to a whirl with a twist (**Fig 43**), that collapsed transforms into a polygon (**Fig 44**). At this point, new design variants begin to emerge, and linear patterns stand transforming in curved shapes^[37].



Fig 38: Leather sample. *Origami Flasher*. Jeremy Shafer & Chris K. Palmer. ([Shafer](#)).



Fig 39: Leather sample. *Eight-Flap Sphere*. Jun Mitani. ([Mitani 2016: 12](#)).

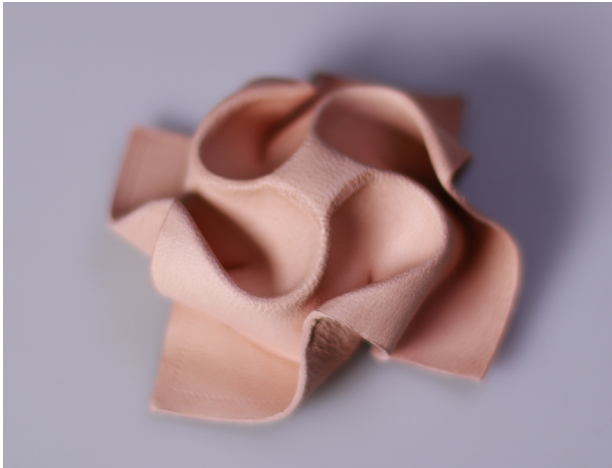


Fig 40: Leather sample. *Flower*. Jun Mitani. ([Mitani 2019: 65](#)).



Fig 41: Leather sample. *Variation Japanese Apricot Flower*. Jun Mitani. ([Mitani 2016: 14](#)).

^[37] The patterns of **Fig 43**, **44** and **45** are exclusively composed of straight lines.



Fig 42: Leather sample. Whirlwind spiral obtained by collapsing and twisting Fig 41 (*Japanese Apricot Flower* variation).



Fig 43: Leather sample. Octagonal twist peak exploration.



Fig 44: Leather sample. Squared twist exploration.

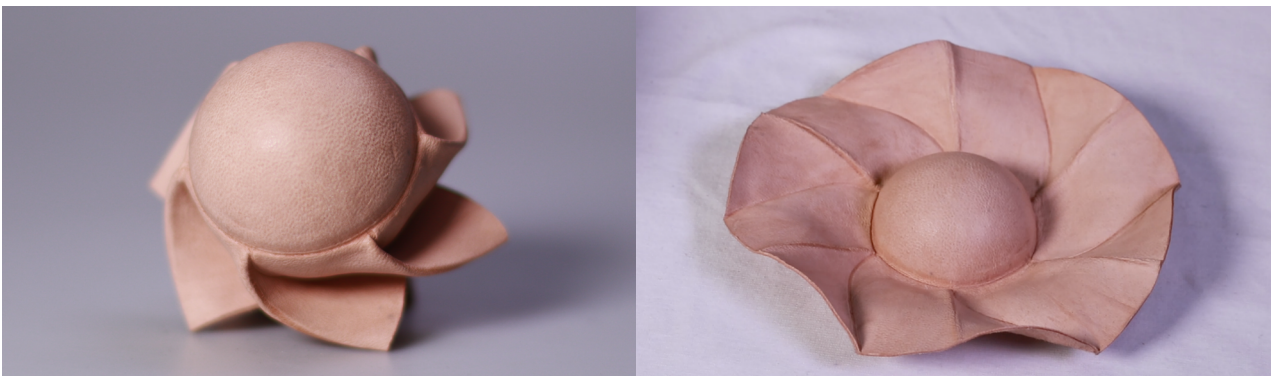


Fig 45: Leather sample. Pentagonal twist peak exploration.

Dialogue with the human

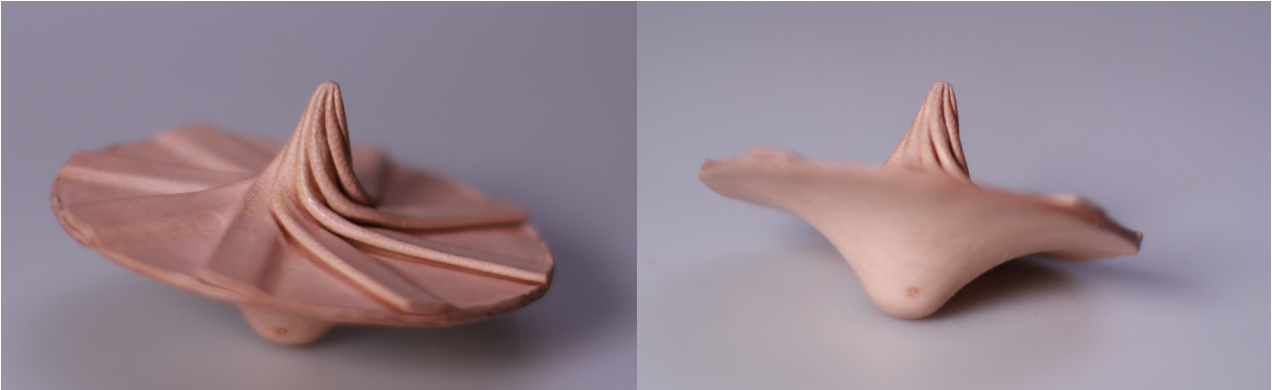
In this last part, the fold finds its own language through leather and tells its own story embodied in artefacts. The fold, the intelligent hand and the material collaborate with each other and present their truth to the human. That's why, despite the objective of this project being mere experimentation, it has led to reflecting first-hand on leather folding, which consequently has resulted in the creation of small artefacts born from the process. Artefacts that unify two techniques: one usual of paper (folding) and another characteristic of leather (moulding). The intelligent hand, through the fold, listens to the material and benefits from its properties creating a combined narrative. A narrative that suggests a window of possibilities, especially in the context of leathercraft and accessory design. A good comparable example is the application of origami designs in fabric^[38], developed by Chris K. Palmer and Jeffrey Rutzky ([K. Palmer 2011](#)). Other artisans, such as Kendrick Feller, Ilan Garibi or Eduardo Giménez, have also applied origami patterns in other craft fields such as metalwork ([Feller](#)) ([Garibi](#)) or bookbinding ([Giménez](#)).

However, *Folding Leather* aims beyond aesthetic beauty. Where the use of leather allows the interaction of the human with the form repeatedly without fear of destroying the material and their dialogue radically changes. From an internal dialogue of observation; to an open dialogue of haptic understanding. That's why this process has led me to the creation of artefacts that invite repetitive manipulation and human touch, besides entertainment and joy. Three artefacts that use this interlaced technique to find their shape and suggest their mechanism. Artefacts that seek for an interactive bond with the human beyond aesthetic beauty. That so, all the experiments carried out in this project are welcome to be manipulated by the human hand.

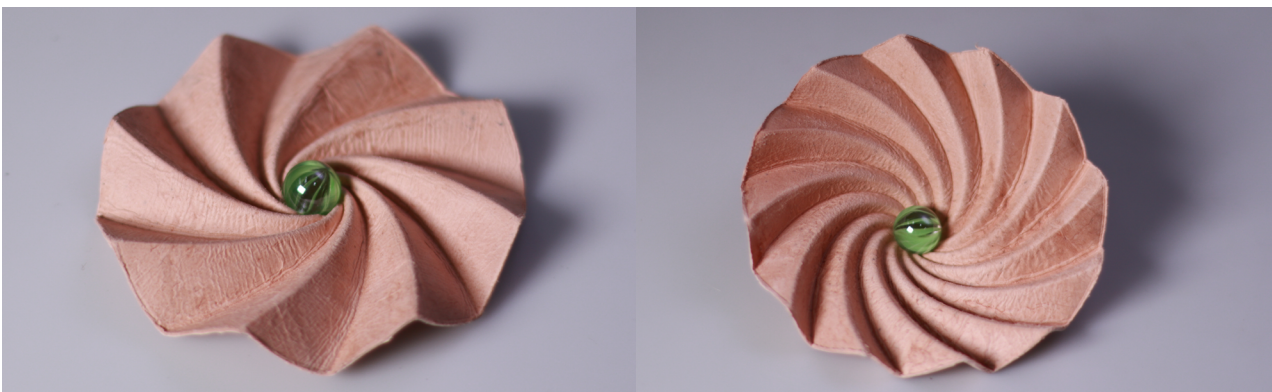


The first artefact, which I have called *Hexagonal Twisted Sphere*, arises from **Fig 41** (Variation *Japanese Apricot Flower*). The idea was to create a similar purse with a new folding pattern and use the properties of leather to mirror the twist hollow and create a storage compartment. In addition, it can be observed that the artefact remains open in a stable manner, which could suggest the shape of a hat. Could this object be a hat and a bag at the same time?

^[38] In this case their technique is based on stitching points that form the geometry when sewed.



The second artefact, which I have called *Whirl Spinning Top*, is inspired by the previous *Twist Peaks*. It consists of two glued leather pieces; one folded and one shaped. The shape and form of the artefacts suggest its playful functionality: twist its tip with two fingers and let it spin. In the book *Toy Design*, the German author Chris Van Uffelen ([Van Uffelen 2009](#)) calls this type of objects (spinners) ‘Toys for the Soul’ and affirms their power to improve concentration besides recalling childhood memories and having fun.



The third artefact, which I have called *Logarithmic Spinner*, is inspired by **Fig 38** (*Origami Flasher*) combined with logarithmic spirals from Lukasheva’s models. This model consists in making the object spin. It can be manipulated by hands utilising the properties of the shaped leather by squeezing the spiral and releasing it, however the artefact is meant to function by blowing air into it’s centre making it spin faster.

Lastly, I would like to clarify that the purpose of these tactile experiments is to invite the active observer to think and imagine their future. Paraphrasing Yanagui and Yoshizawa; I want you to discover the infinite possibilities of creation ([Lang](#)) and share the joy this has brought me ([Yanagi 2019: 227](#)).

CONCLUSIONS

Looking back, I consider the Moroccan coin purse's dissection process and the consequent reflection of it has formed a fundamental part in the understanding of its story. A story that encompasses its nature, beauty, human interaction, origin... and that leads to the cause or reason of what I have called object's 'mysticism'. To interiorize those conclusions has been fundamental to be able to treat the fold in an intimate way and accept the fold's natural dialogue. Which has permitted me to step out of my previous knowledge and actively learn from it. Therefore, the creation of artefacts and its own technique arised from the process has been the result of the collaboration from the fold, along with the material and the intelligent hand, at the mercy of nature. Through this practice I have realised nature's own ways to create beauty and tell its story; a result of treating her honestly. And that's so, that without the conscious search for aesthetic beauty, this process has led to a certain amount of visual as well as tactile pleasure. I would like to express that the intention of these artefacts (interactive leather origami) is to create a dialogue with the viewer through their tactile manipulation that calls his/her intellect and through which understanding connections are created. It is to say, the aim for the viewer is to interpret nature through the tactile and visual artefacts' experience, to understand the world and to imagine its future.

Although my goal has been to create objects with the same uniqueness as the Moroccan coin purse. I can not assert that the artefacts have or aspire to have that mystical aura that characterises it, since there are many factors that do not depend on the artisan/creator. However, I believe time will decide their mystical future.

From the technical point of view, several moments I have struggled when materialising my ideas. This has led to hours of thinking trying to understand the principles of the geometrical pattern to be able to do my own variations. The creation of moulds and their mechanism has also implied a challenge, that has slowed down the process, in which quality and temporal efficiency has been tried to balance, always aiming to obtain cleaner and better results. Even so, this practice has helped me: to connect in a deeper way with the process, the technique and the material; to learn more about origami and leathercraft; and to merge and apply techniques with which I had no previous experience.

Finally, I want to express that the closure of this stage does not aspire to an end but to a beginning. I consider this project a part of a personal journey and a compilation of the past and present of my artistic path. A manifest that voices my relation with objects and their importance, with the meticulous process engulfing the world of design and craftsmanship, and particularly, with the sincere role of the craftsperson in his/her goal of communicating the story of objects to the world. A thought that hasn't changed its essence and materialised two years ago in the shape of an autobiographical tale ([See Paperwoman"ANNEX 3"](#)).

NOTE: Since I began to be interested in cinematography, I have always said that I would like to make films that make the audience feel the same way I feel when I see Wes Anderson's films. And my aim is to do the same as an artisan; to create objects that make others feel what I feel or have felt for others. That's why I couldn't agree more, when Eric Demaine is asked about his motivation to keep doing what he does he answers 'Fun' ([Gould 2008: 52'](#)) as well as Robert J. Lang expresses the same by claiming: 'I'm having the best fun time of my life' ([Gould 2008: 13'](#)). As a maker and as an active observer I have enjoyed every part of this process. And I hope you do too.

SUMMARY

This project focuses on exploring the reasons why an object has the potential to become significant for the human and manifest certain mysticism. Specifically, a small Moroccan coin purse, made of thin folded leather, that crossed my path. As well as the experimentation and application of its technique with the intention of creating objects with a similar significance. This thesis is framed in the practical field of leathercrafts and the art of paper folding (origami). Where initial questions are investigated such as the significance and possibilities of artefacts born from paper folding technique applied to fine leather and their valuation in the field of crafts and the development of small accessories. The project is approached through autoethnographic, anthropological, artistic and practice-led research and its structure is divided into two main chapters:

The first chapter corresponds to the introduction of the reasons that have given rise to the realisation of this project. Here I talk about the antecedents of my connection with leather and paper and I expose my own relationship with everyday objects which leads to the discovery of the Moroccan purse: an object with a mystical feeling and the core of this project.

The first chapter (triggered by the book *The Beauty of Everyday Things* written by the Japanese thinker Soetsu Yanagui) analyses, through an auto-ethnographic and anthropological approach, the possible reasons why the small Moroccan coin purse owns certain mysticism. Here the nature-object-human relationship is exposed at an emotional, intellectual and temporal level. In the first place, the so-called ‘vital materialism’ of Jane Bennett is introduced, suggesting material’s agency which communicates its nature to the human and maintains an intimate dialogue with the artisan. Secondly, the intellectual connection between the object and the human being is presented as a way of understanding the world. This theory is exemplified by the practice of origami which, inspired by nature, serves as an educational tool that helps humans understand complex concepts (geometry). Thirdly, the time component is introduced, where the object acquires its own story and has the potential to express it through its materiality. And lastly, the origin of the object and its cultural crossover is suggested by a series of clues.

In the second chapter there is a shift from speculative theory to experimental practice. Here the artisan maintains an intimate dialogue with the material inspired by the works of artists Maarit Mäkelä (2022) and Nithikul Nimkulrat (2009) and a series of experiments related to the Moroccan purse technique take place: leather folding. First, a preliminary experimentation on paper is carried out with the objective of understanding the ‘fold’ in its dialogue with nature. It is formalised in the form of an audiovisual reflection where the ‘main fold’ in the first person meets three external agents: light, air and fire. This is followed by the main experimentation involving the transition from paper to leather where different folding patterns are experienced: spirals and twists (from origami artists such as Ekaterina Lukasheva, Jun Mitani or Chris Palmer), as well as materials derived from animal skin: vegetable tanned leather, parchment and bonded leather. In this series of tests, the ‘fold’ reflects on its material nature and its interaction with the intelligent hand (proposed by Richard Sennet in his book *The Craftsman*).

As a result of experimentation, artefacts arise from a combined technique: folding (typical of paper) and modelling/shaping (typical of leather). These artefacts, like the Moroccan coin purse, aim to invite the viewer to interact with them, discover and imagine their future.

This project arises from the personal motivation of two present disciplines in my professional path: papercraft and leathercraft. A challenge that combines engineering, arts and design; and that seeks to gain a better understanding of the limits and possibilities of these combined disciplines, in addition to tangible knowledge gaining and improvement of skills. When I came to EKA I wanted to get away from engineering to be able to get closer contact with the object-creating process and a new point of view as a designer. That is why I consider this project as a good compilation of my path during this master’s degree.

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ANNEX 1

TECHNIQUE: PATTERNS AND MOULDS

TECHNIQUE: patterns and moulds

The creation of these experiments and shapes start with the choice of a pattern. The selection of each pattern is done due to resemblance with the twist fold, accessibility (free sources) and personal interests. The choice of unfamiliar patterns implies a plus since it gives space to innovative results. Although, the identical reproduction of such patterns or their variations has resulted in a big challenge since it has been required to understand the physics and principles of the geometry. A great help in this aspect has been the web *origamisimulator.org* which allows users to upload a pattern and obtain its 2D or 3D folded shape.

Next, the pattern is reproduced in a vector graphics editor program (Adobe Illustrator). Once the pattern is prepared and tested in paper, it is modelled in a 3D modelling programme (Rhinoceros 3D) and formed by a 3D printer in the form of embossed moulds. Within this process, the laser-cutting technique has also been used for the creation of moulds. Although it has turned out to give cleaner results, its creation process has required the spending of more time and resources.

These moulds are meant to cold press the wet material piece and draw in its surface crease patterns aiming to be more accurate than the human hand plus reducing the transfer time of the motif. As well as in paper, each pattern is divided in two; mountain folds (red) and valley folds (blue). This means every mould consists of two pieces, one with the red pattern that presses the back side of the material and the other (mirrored) with the blue pattern that presses the front side of the material. This technique creates a certain memory in the material that makes it easier for the artisan to hand model the shape and follow the bending lines more precisely.

It is important to press the entire piece of material before transferring the drawing; in this way, there will be better results on the surface of the material and its faces will be more rigid and stable. After transferring the pattern, the material must be modelled by hand before it dries. It is important to go through the folds over and over again making sure that the final dry shape is as desired. During this folding process, the help of tweezers and leather modelling tools (e.g. embossing spoon) becomes a key factor in the quality of the outcome.

Folding Leather

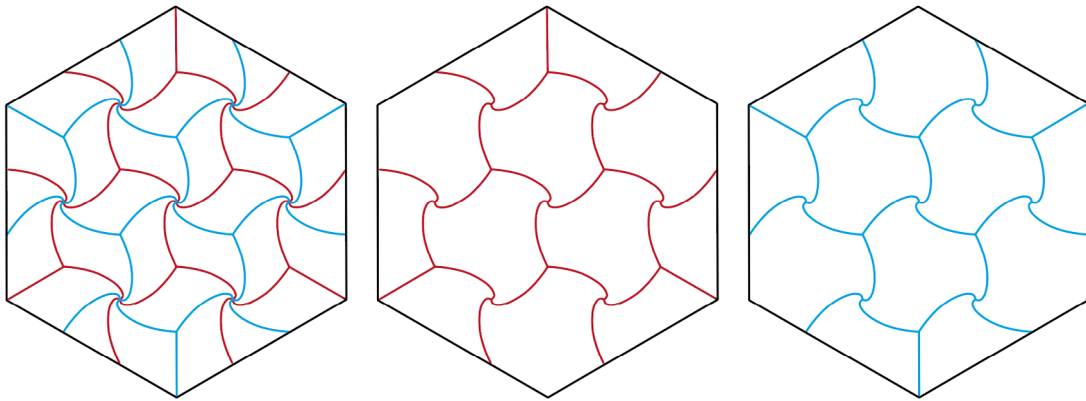


Fig 1: Pattern. *Triton-A*. Ekaterina Lukasheva. ([Lukasheva 2021: 124](#)).

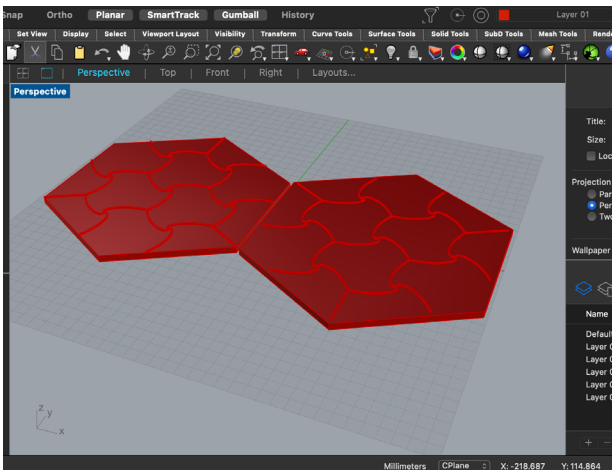


Fig 2: Rhinoceros 3D. *Triton-A*. Ekaterina Lukasheva. ([Lukasheva 2021: 124](#)).

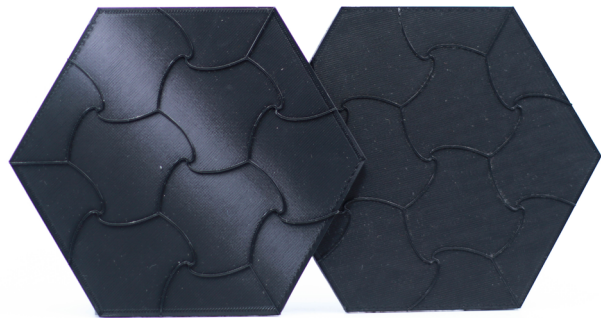


Fig 3: 3D printed Moulds. *Triton-A*. Ekaterina Lukasheva. ([Lukasheva 2021: 124](#)).

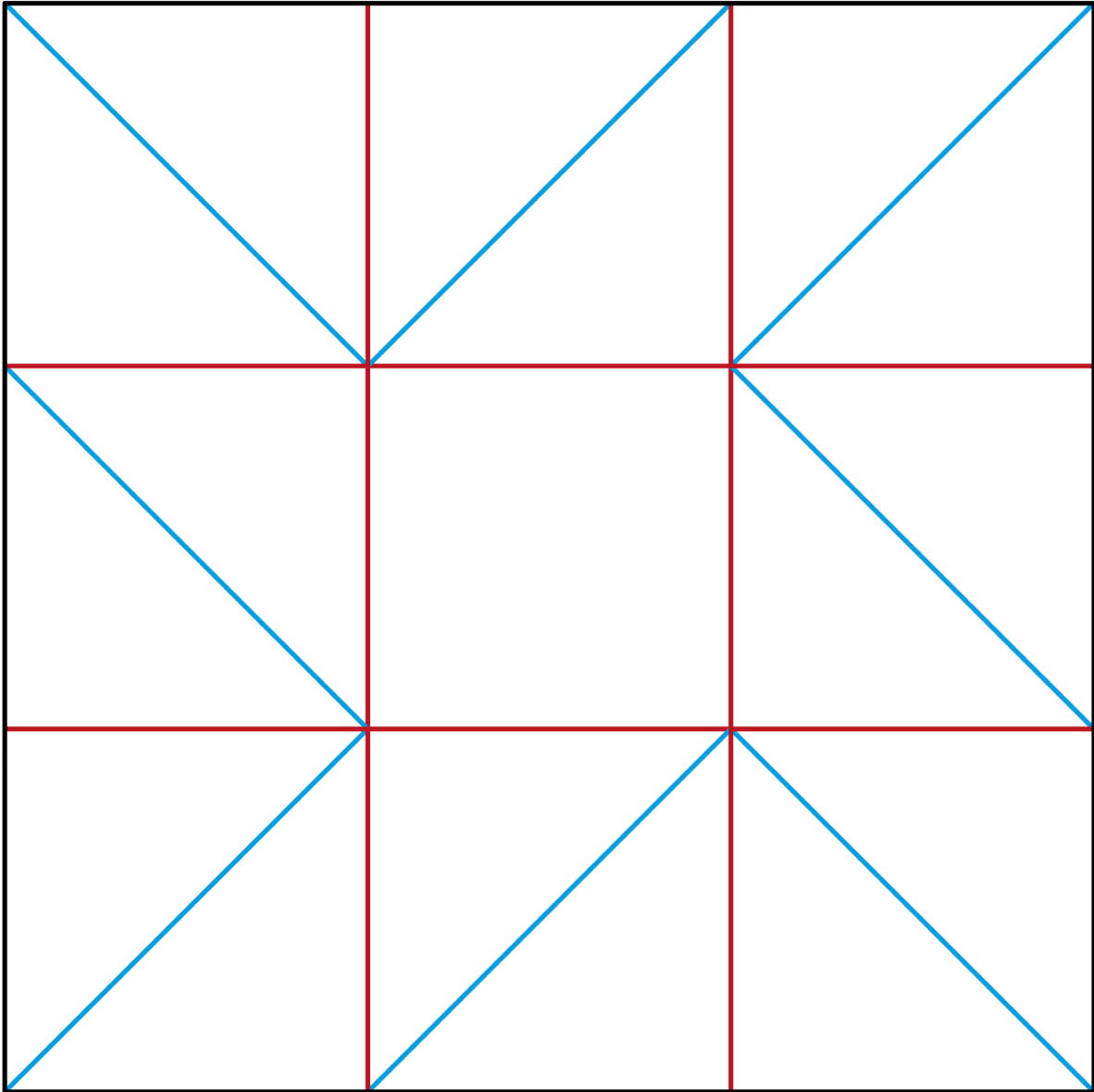


Fig 4: Moulds and Pressed leather. *Energy-A*. Ekaterina Lukasheva. ([Lukasheva 2021: 127](#))

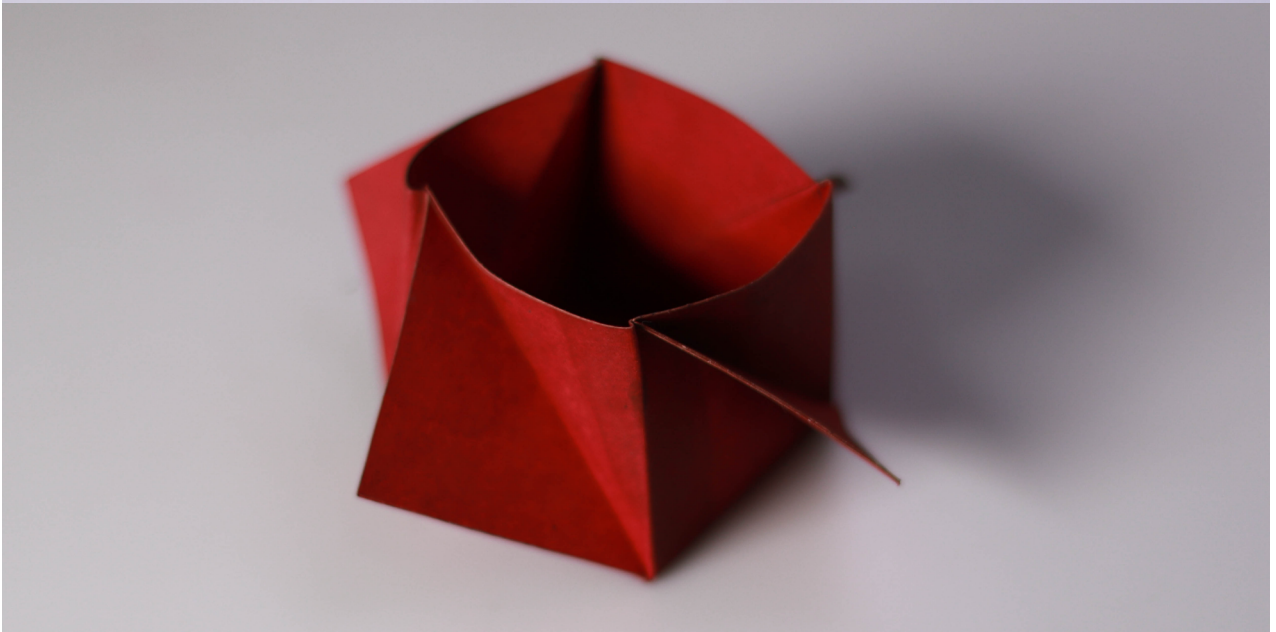
ANNEX 2
EXPERIMENTS CATALOGUE

Moroccan Coin Pocket

Origami Pattern

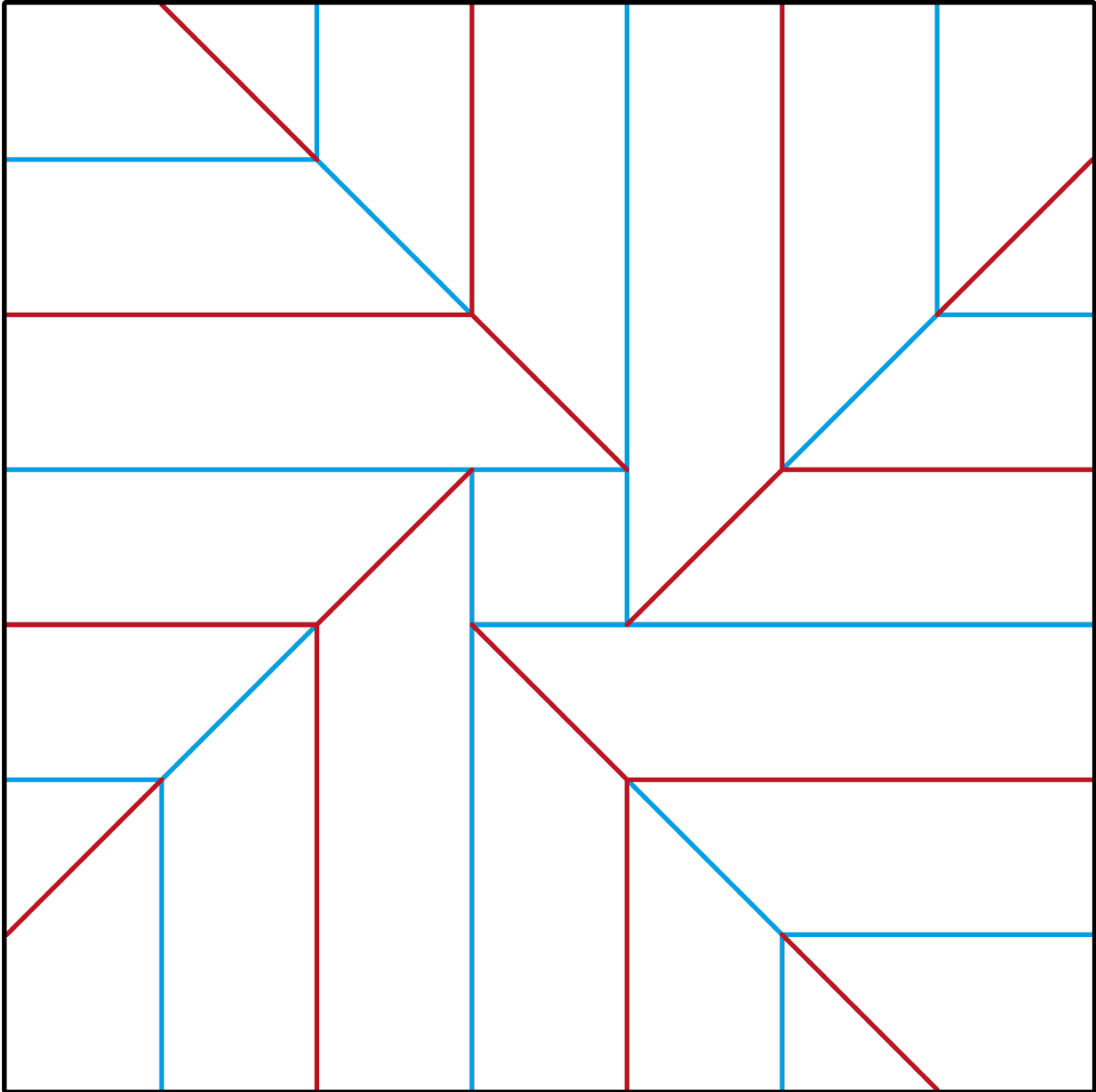


Folding Leather



Origami Flasher

by Jeremy Shafer & Chris K. Palmer ([Shafer](#))

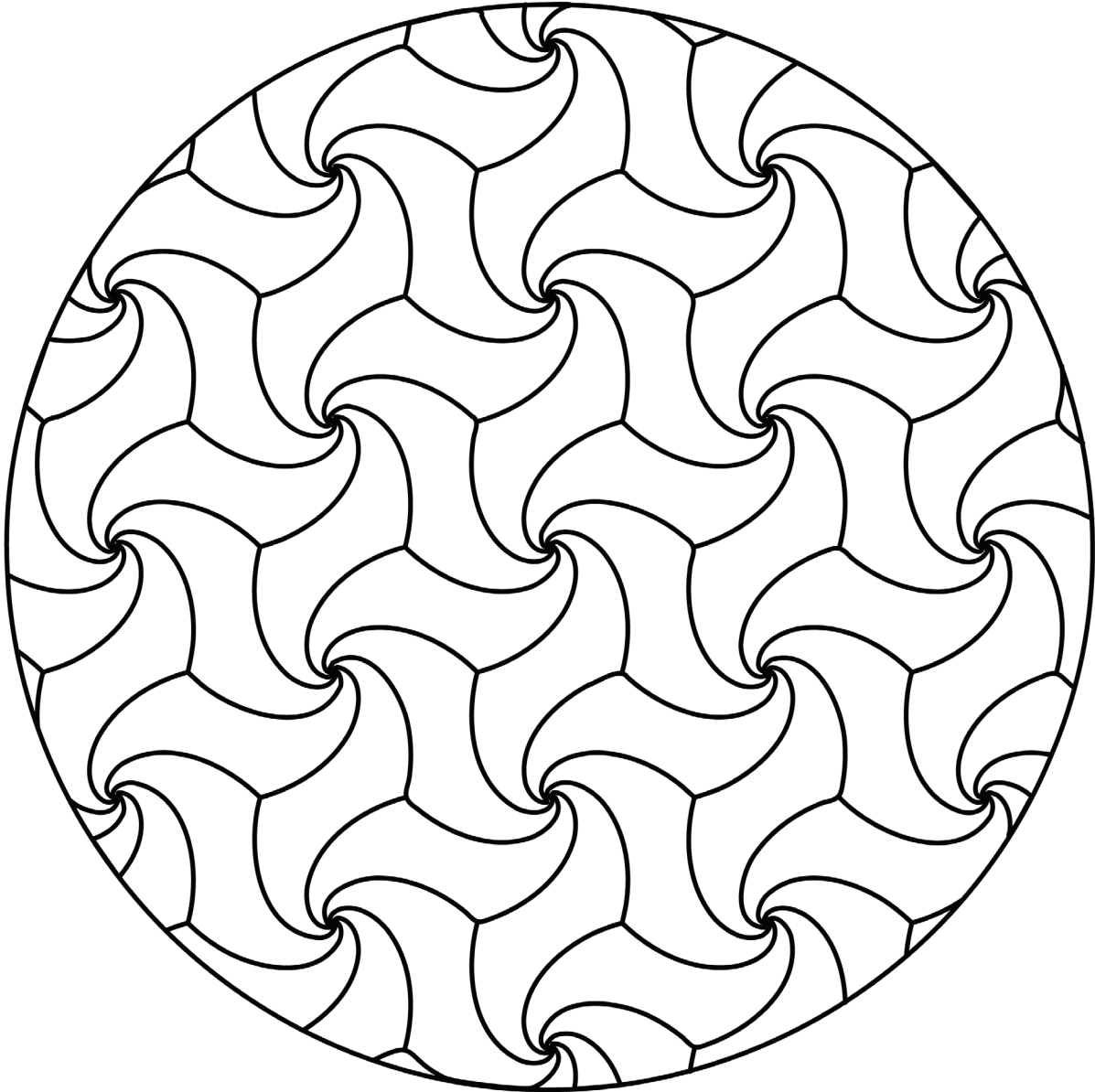


Folding Leather



Hex Spiral Tessellation

by Kendrick Feller ([Ghassaei](#))

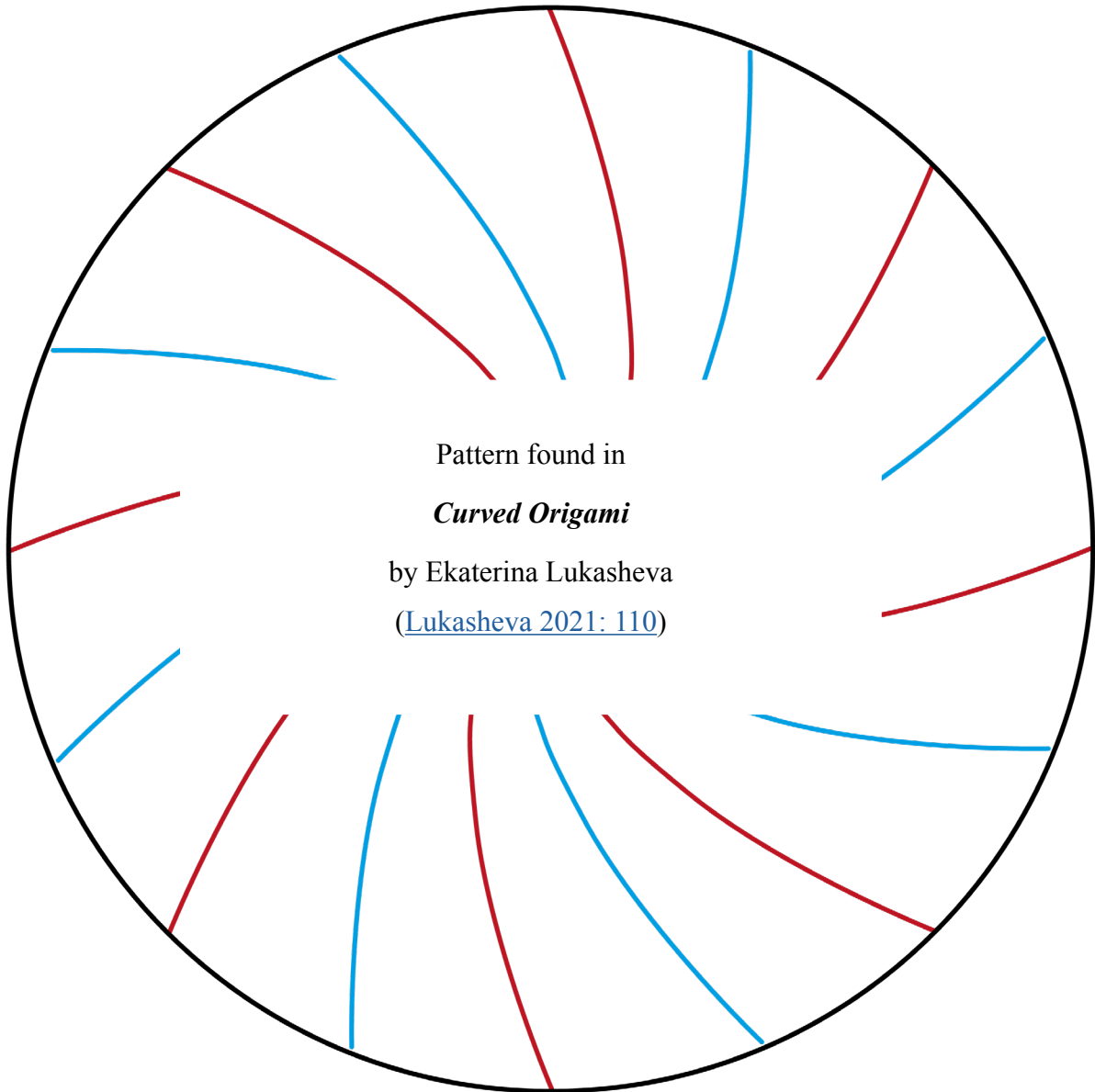


Folding Leather



Eye of Storm

by Ekaterina Lukasheva ([Lukasheva 2021: 110](#))

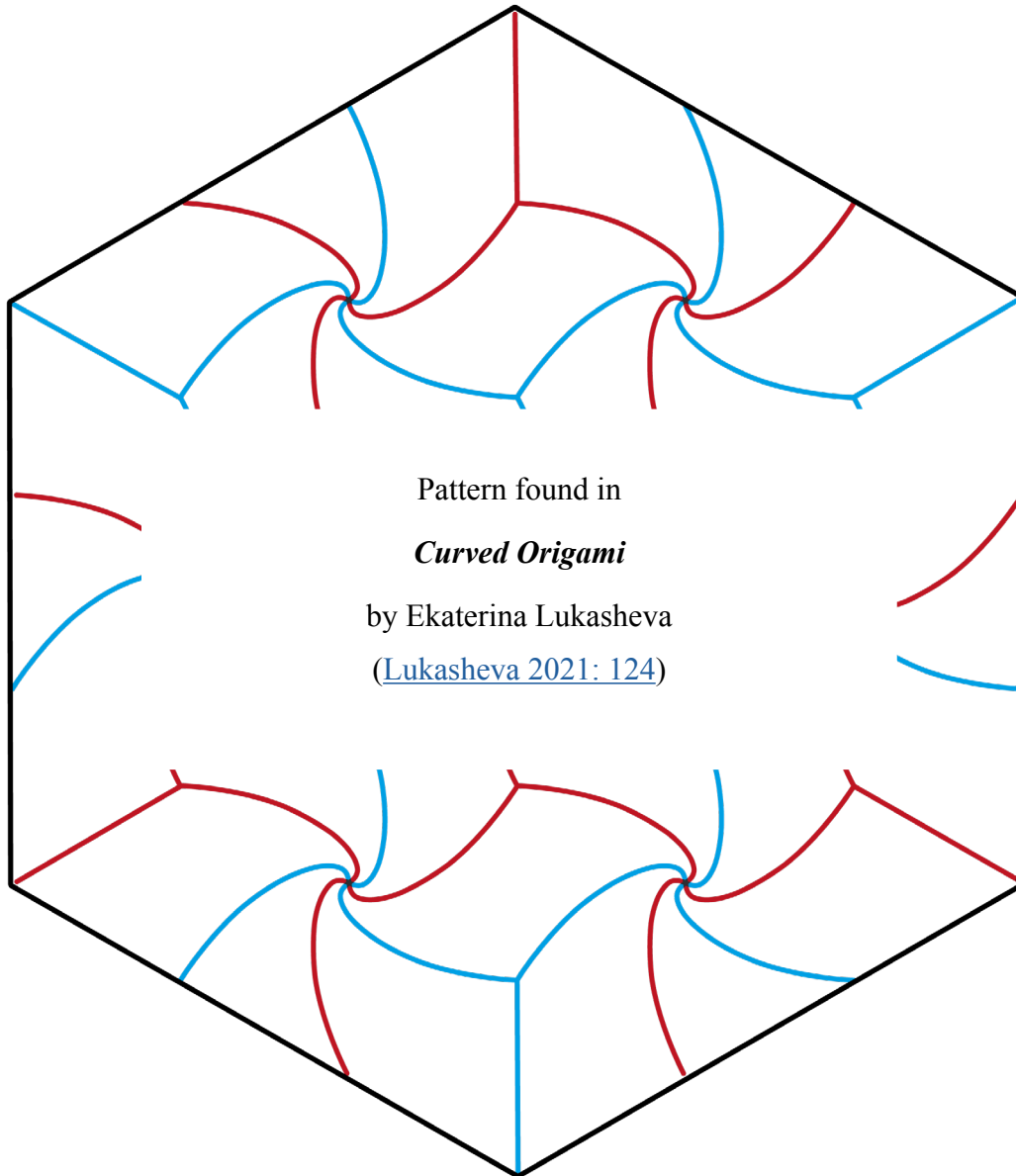


Folding Leather

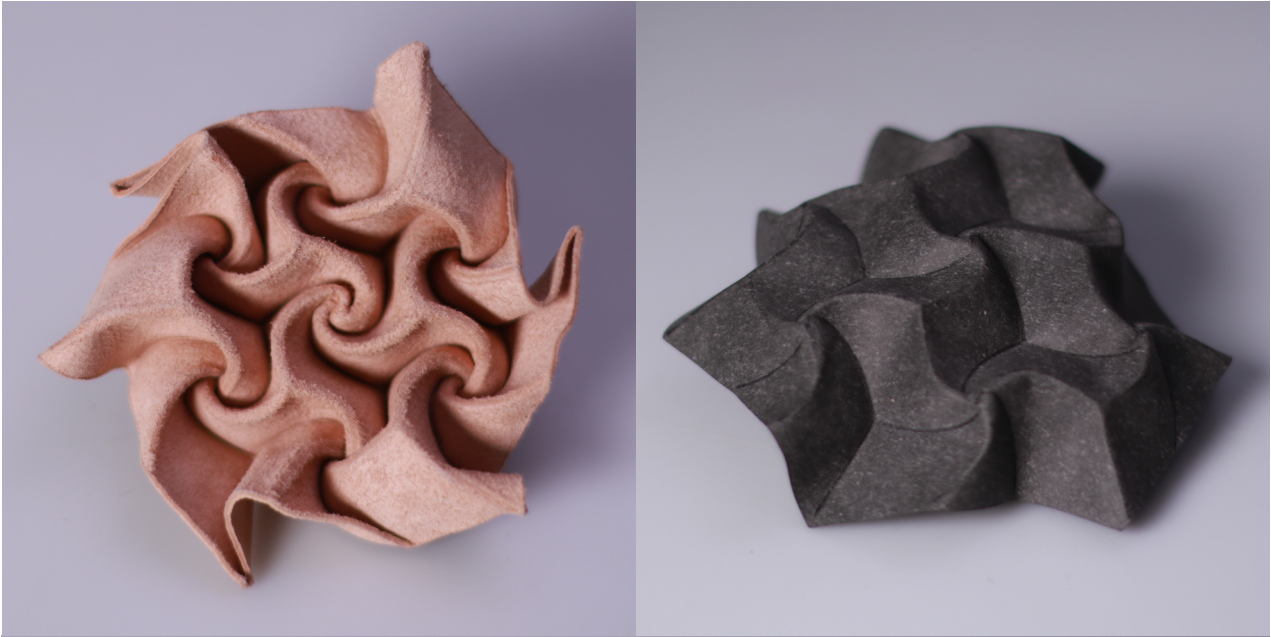


Triton-A

by Ekaterina Lukasheva ([Lukasheva 2021: 124](#))

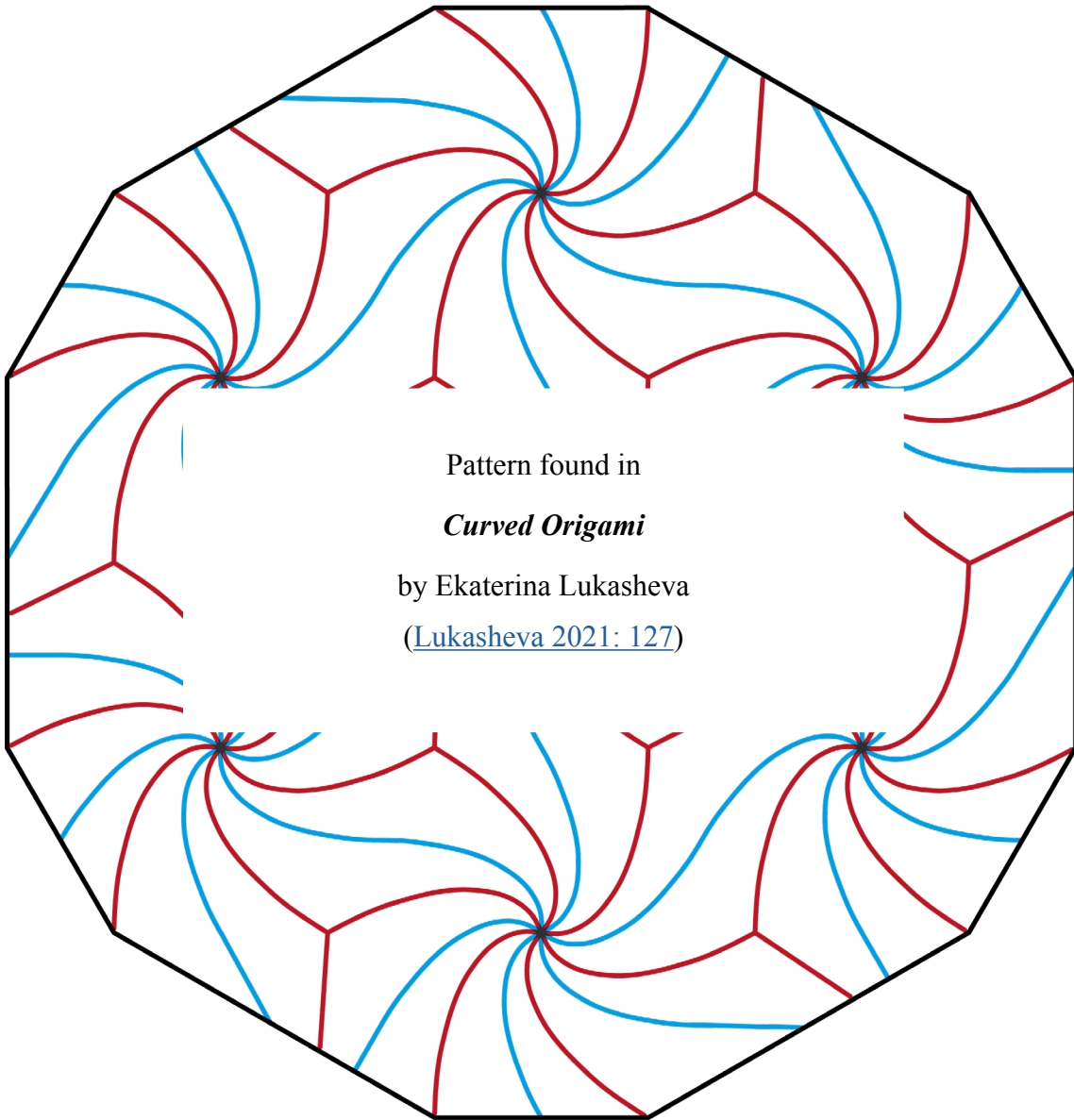


Folding Leather



Energy-A

by Ekaterina Lukasheva ([Lukasheva 2021: 127](#))

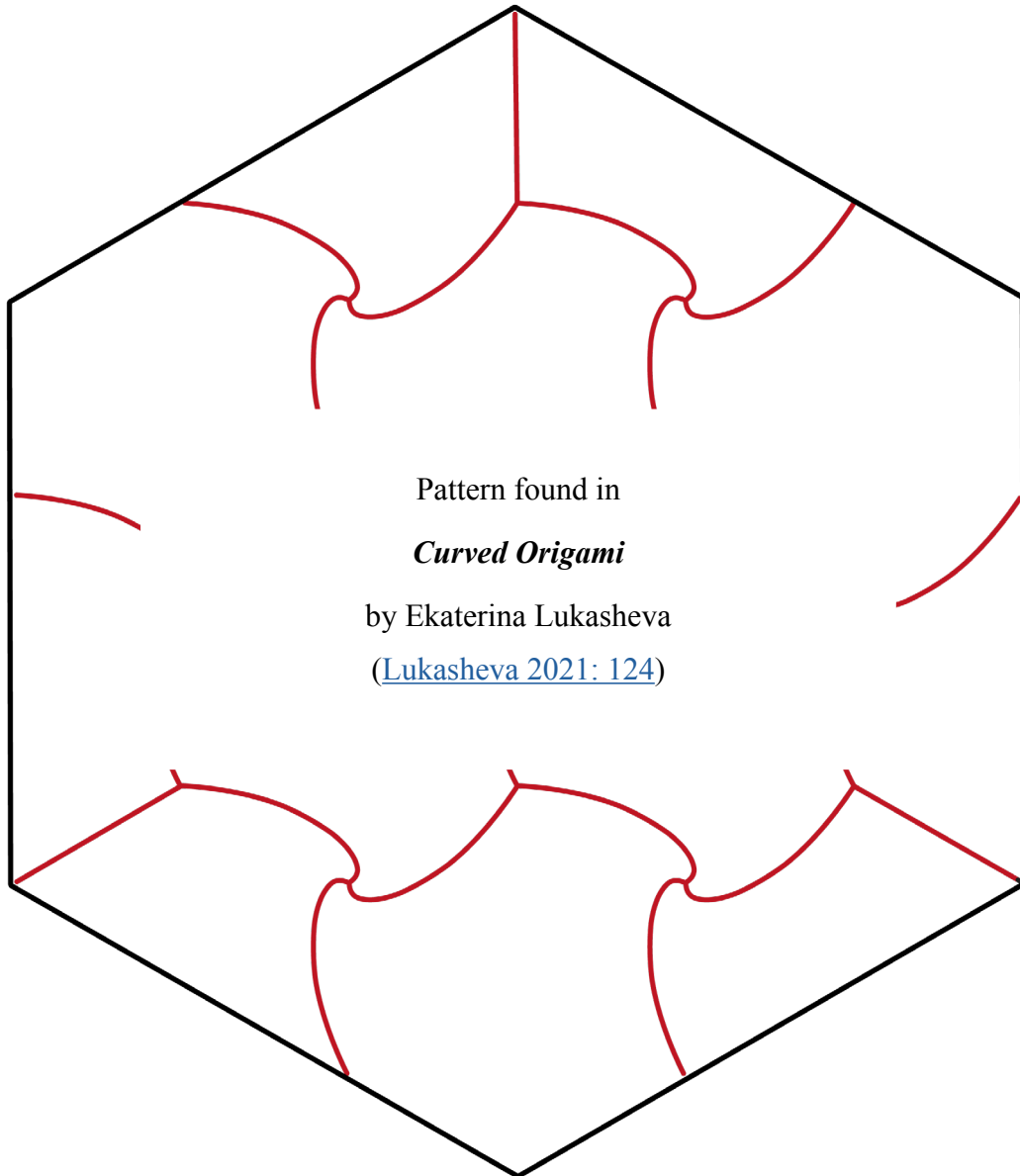


Folding Leather



Own variant of *Triton-A*

by Ekaterina Lukasheva ([Lukasheva 2021: 124](#))

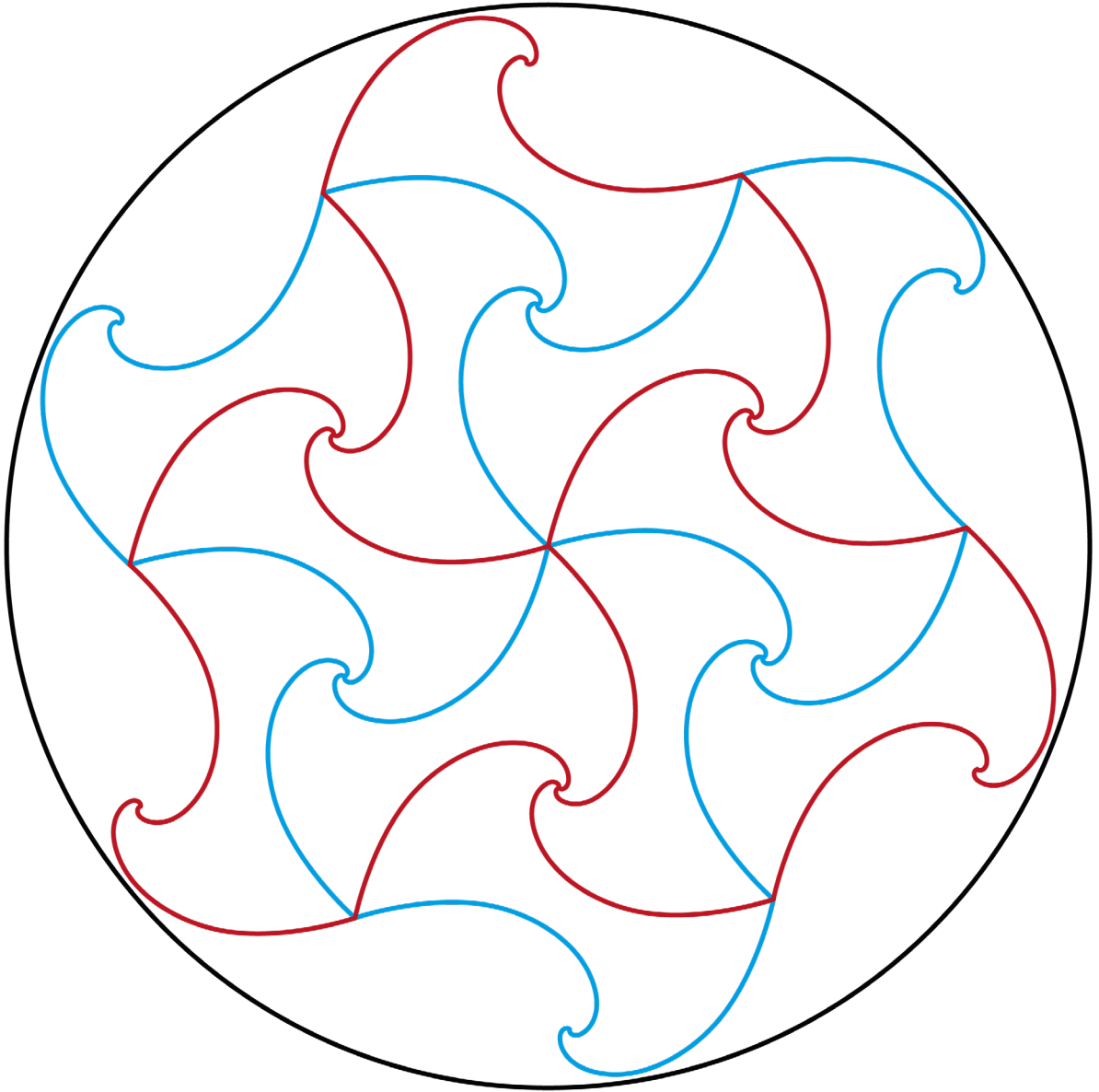


Folding Leather



Experiment with logarithmic spirals

Own design

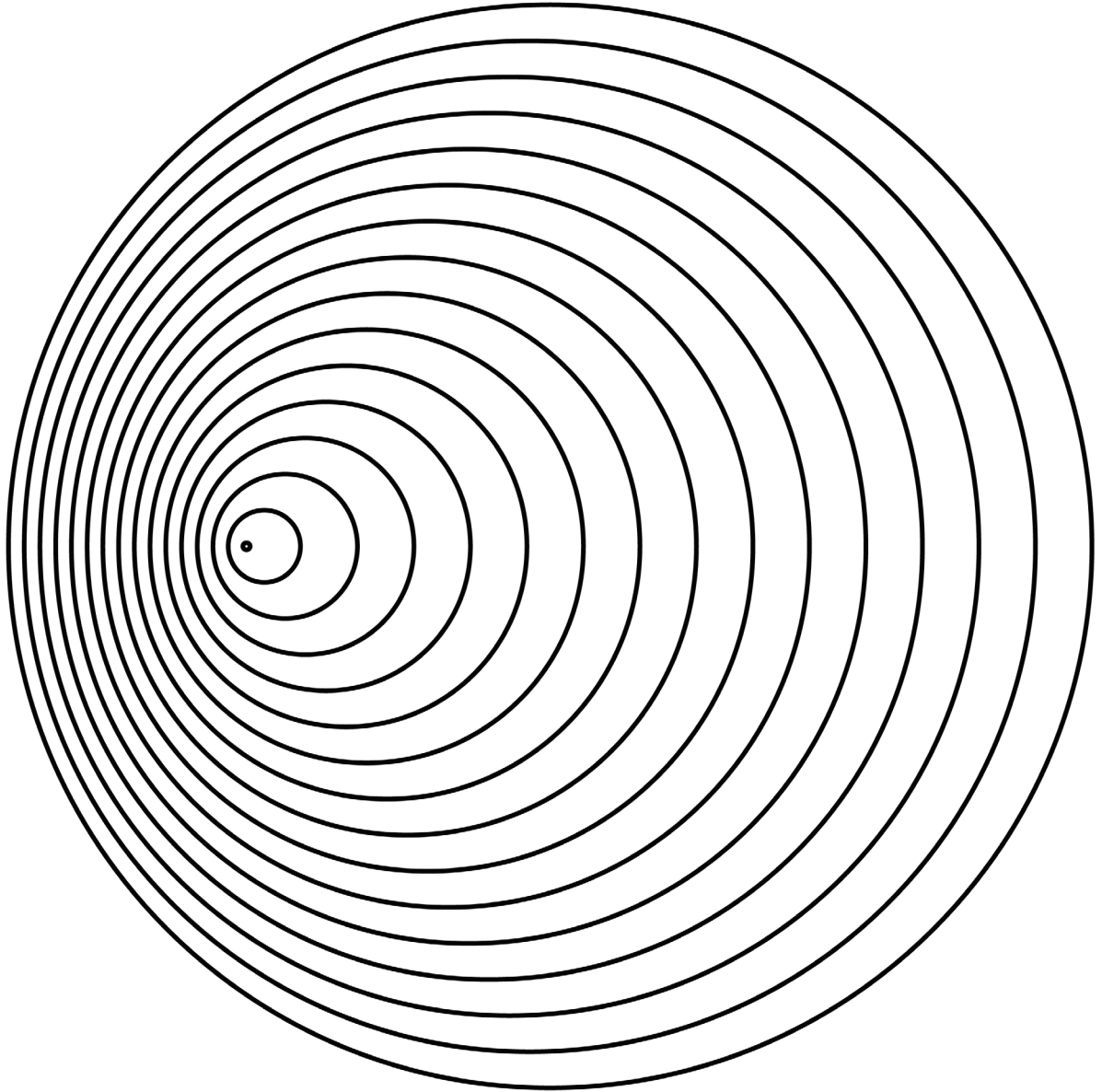


Folding Leather

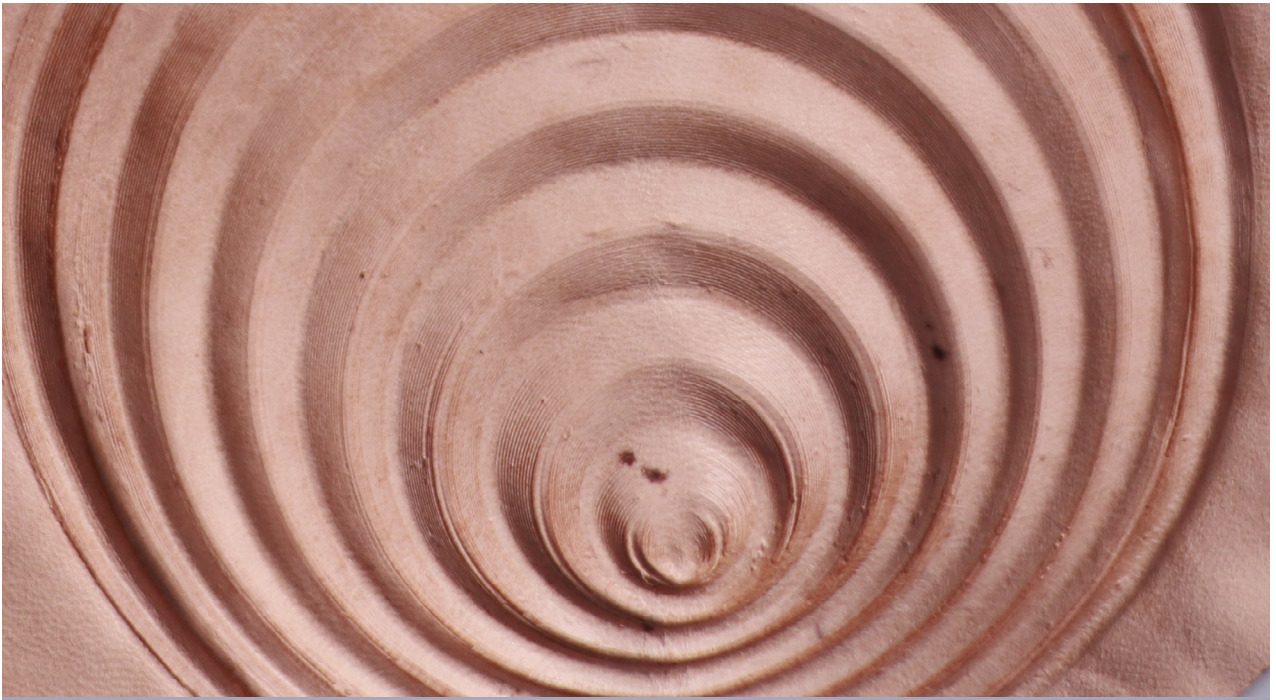


Experiment with Circunferences

Own design

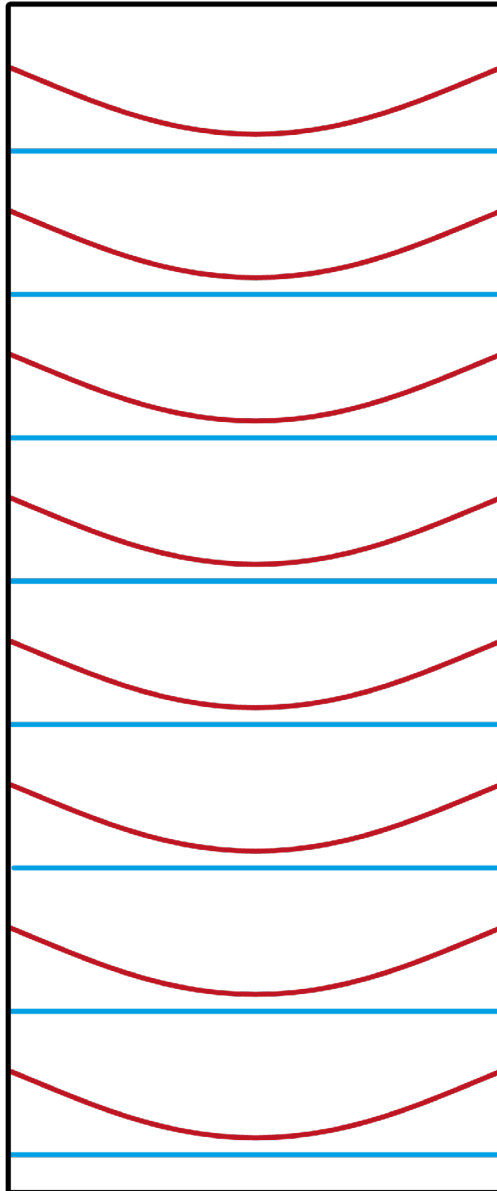


Folding Leather



Eight-Flap Sphere

by Jun Mitani ([Mitani 2016: 12](#))

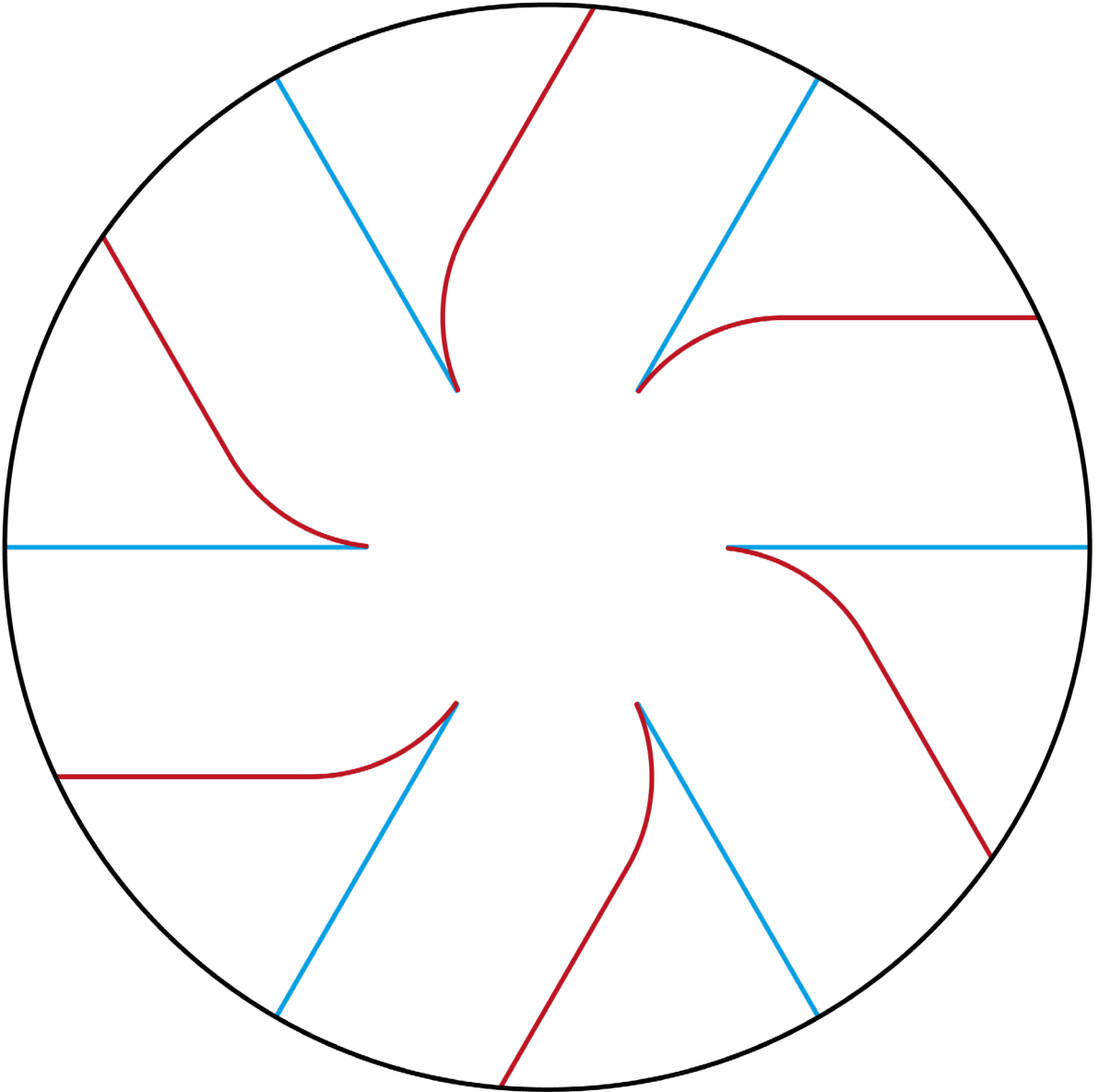


Folding Leather



Own variation of *Japanese Apricot Flower*

by Jun Mitani ([Mitani 2016: 14](#))

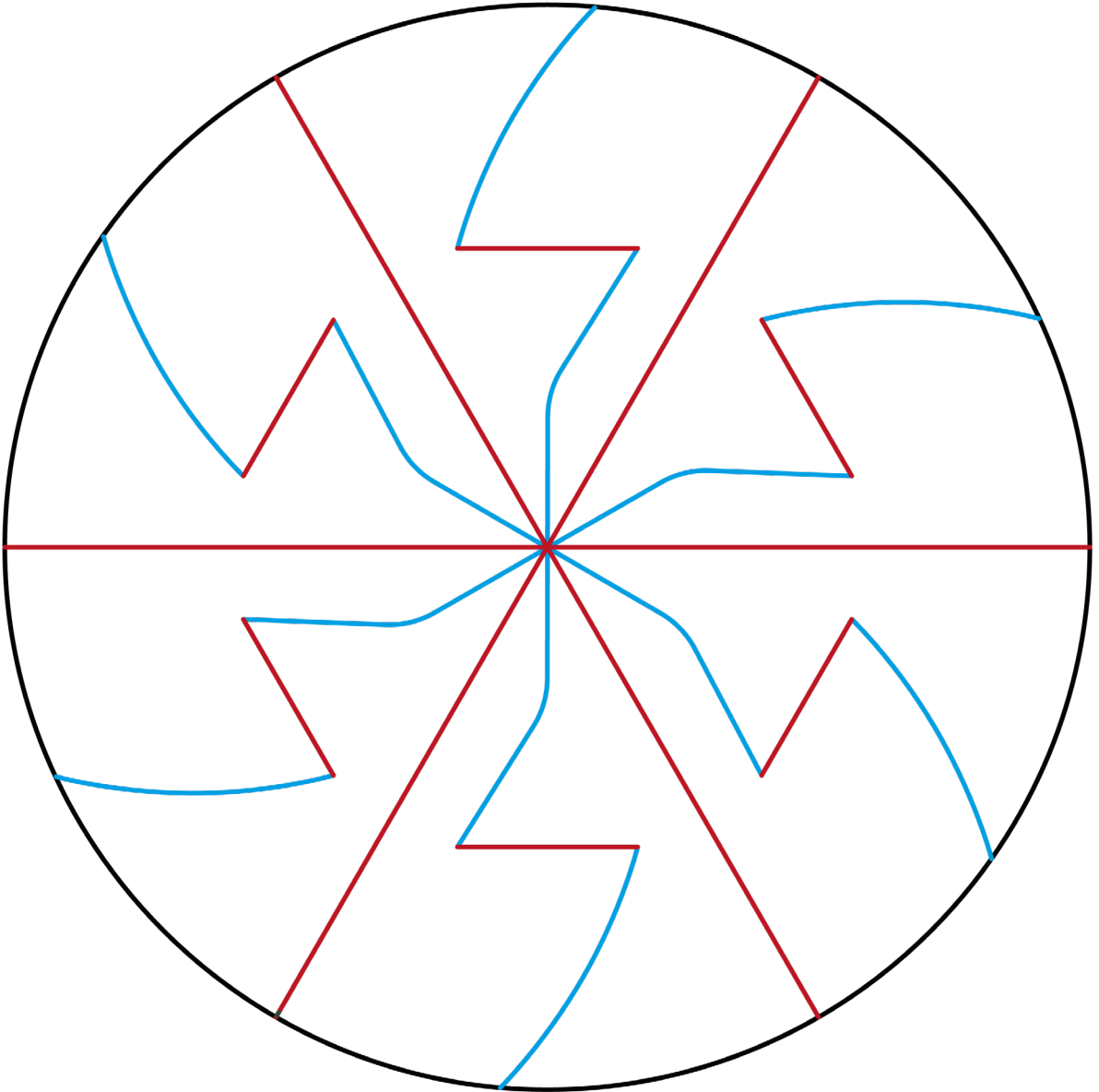


Folding Leather



Whirlwind Spiral

Own design

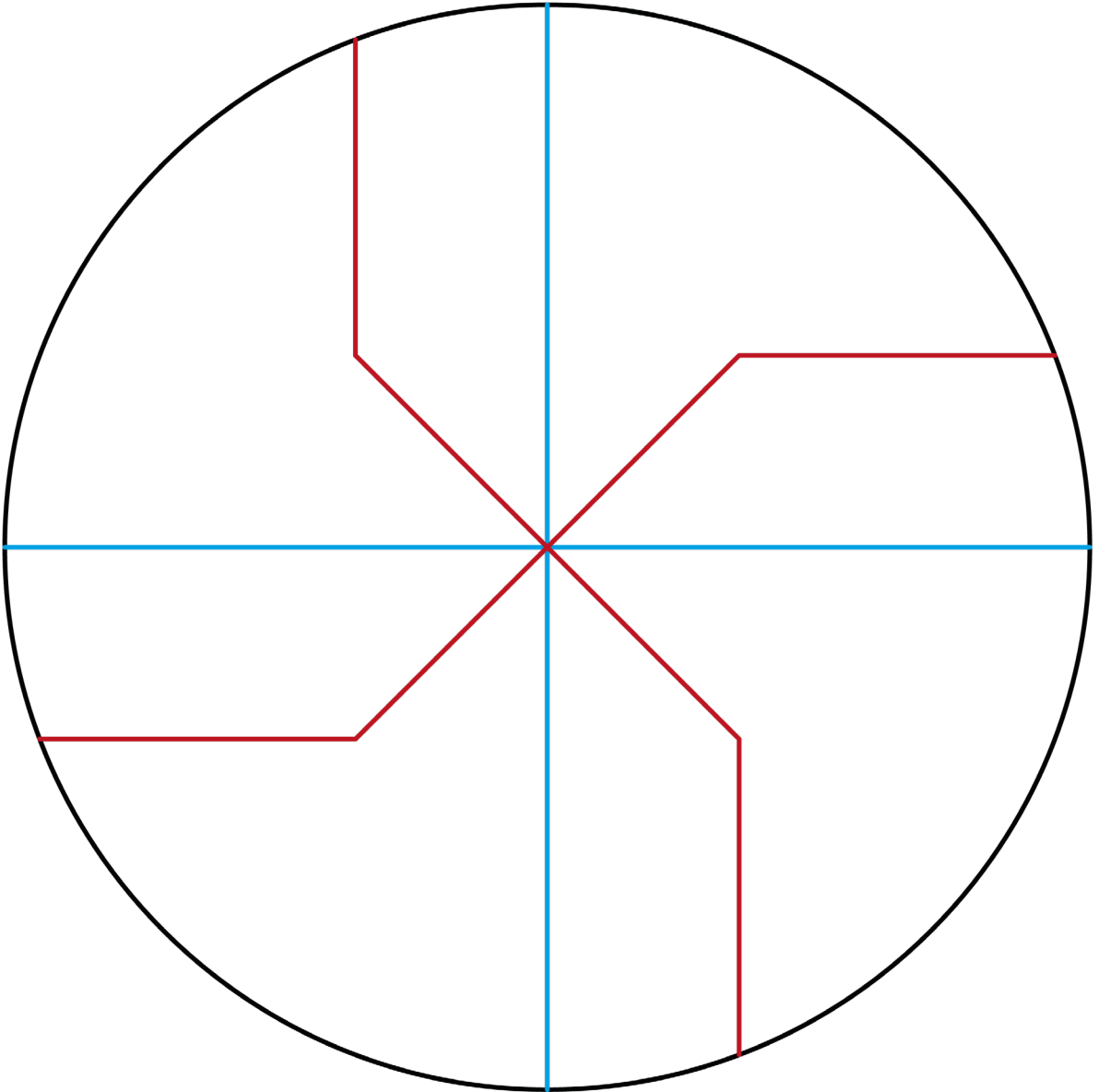


Folding Leather

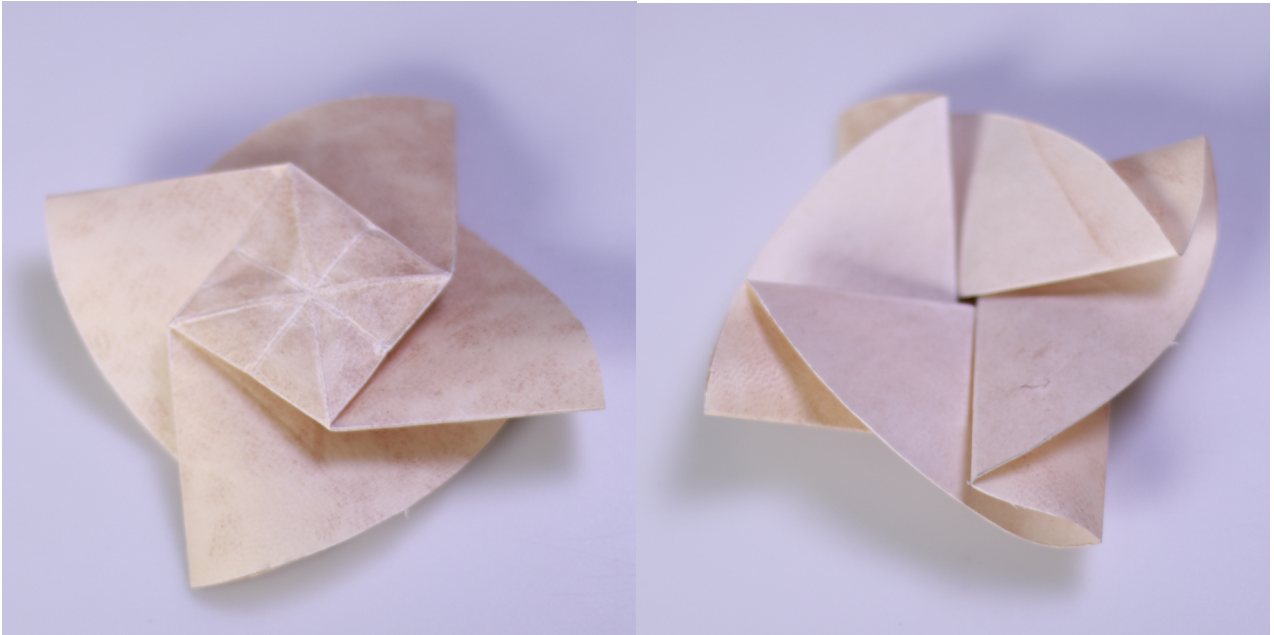


Squared twist peak exploration

Own design

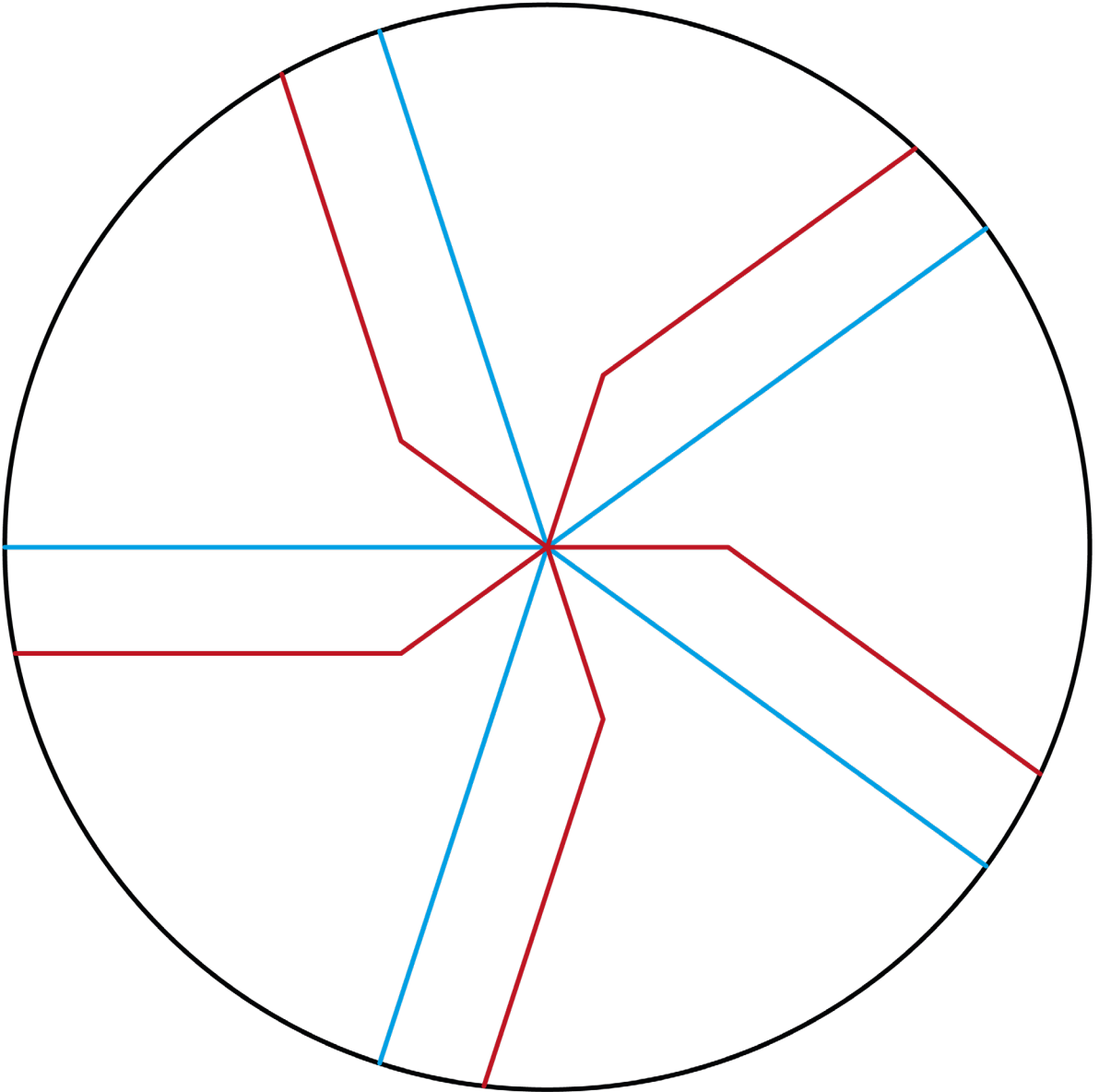


Folding Leather

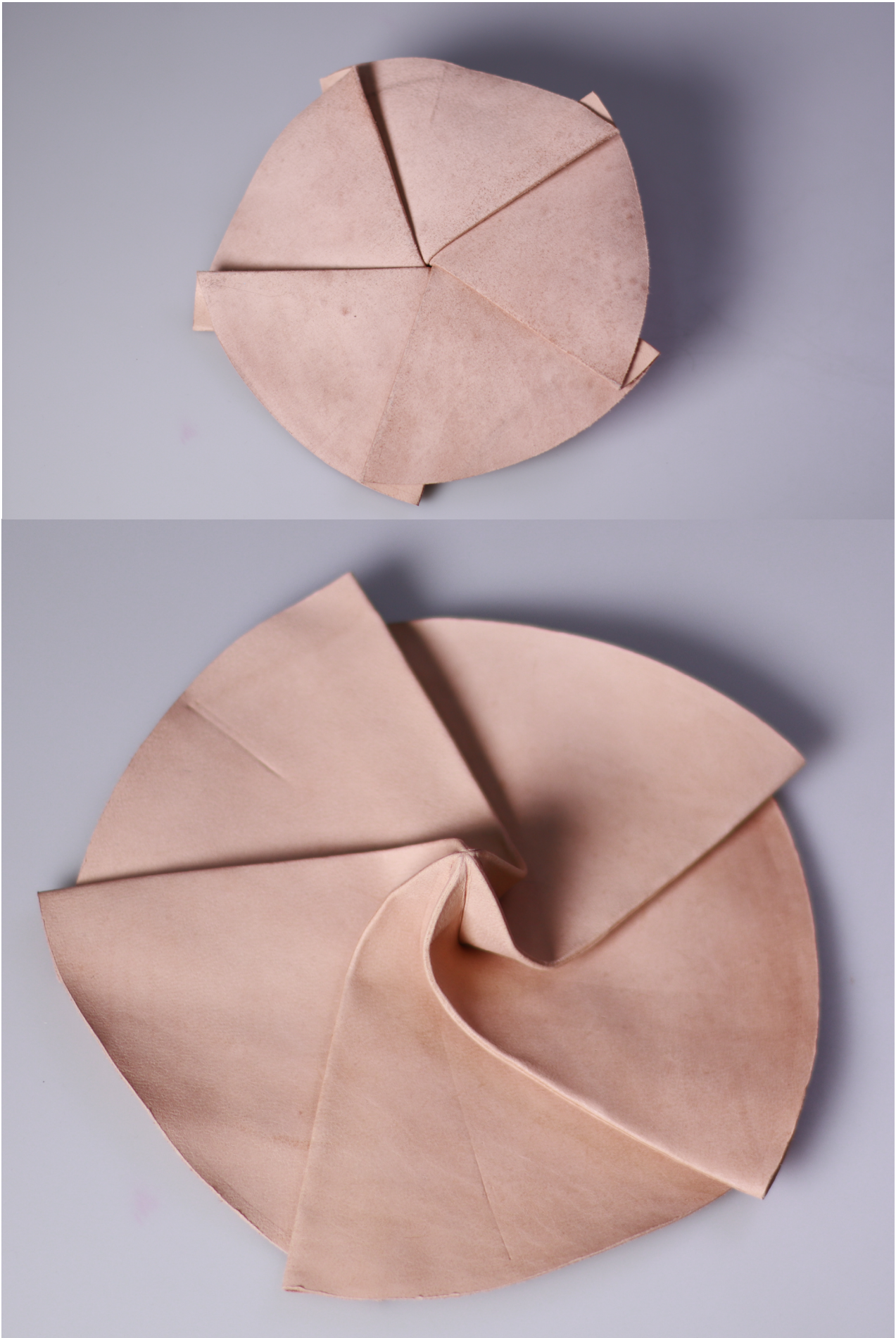


Pentagonal twist peak exploration

Own design

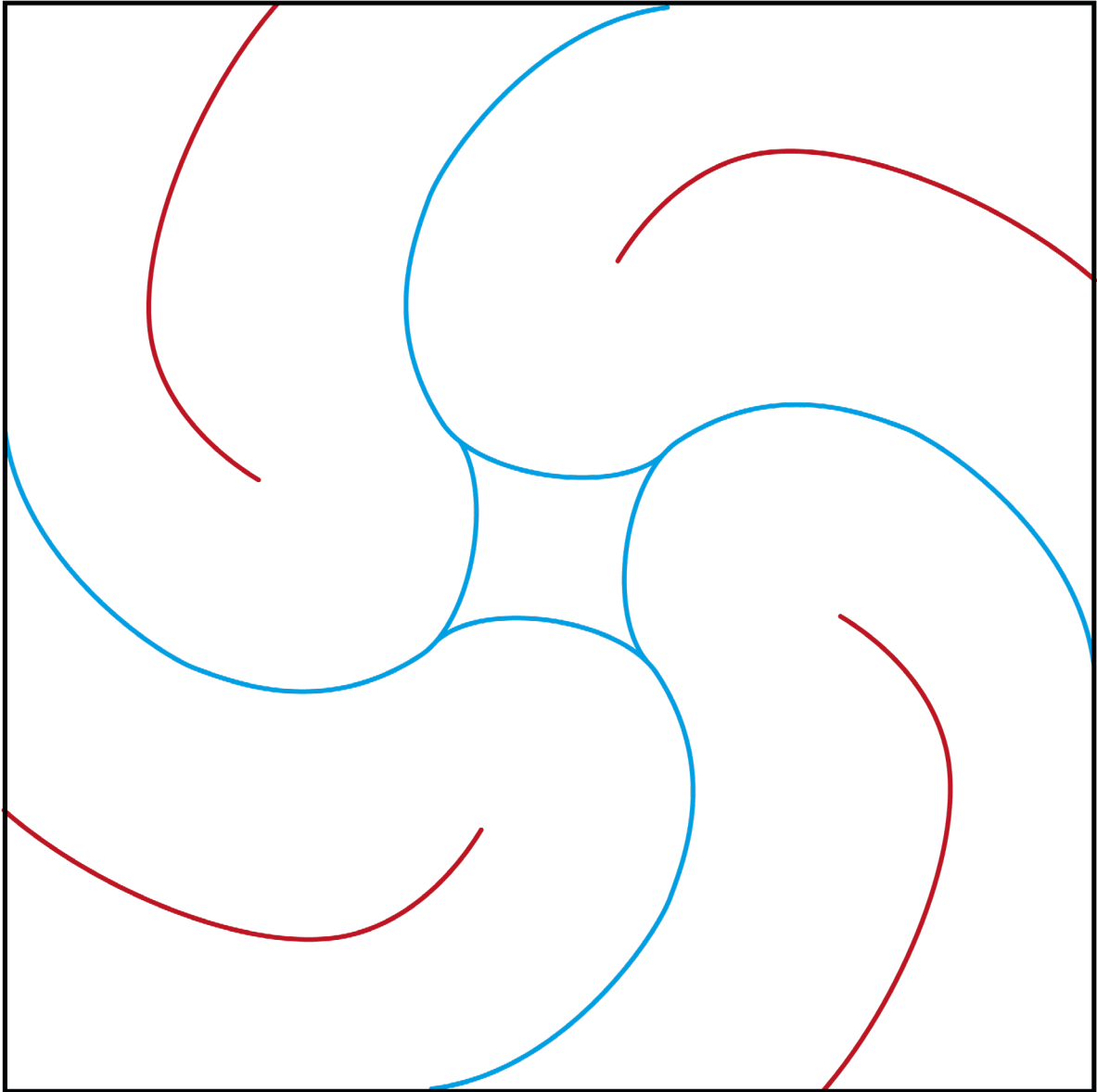


Folding Leather

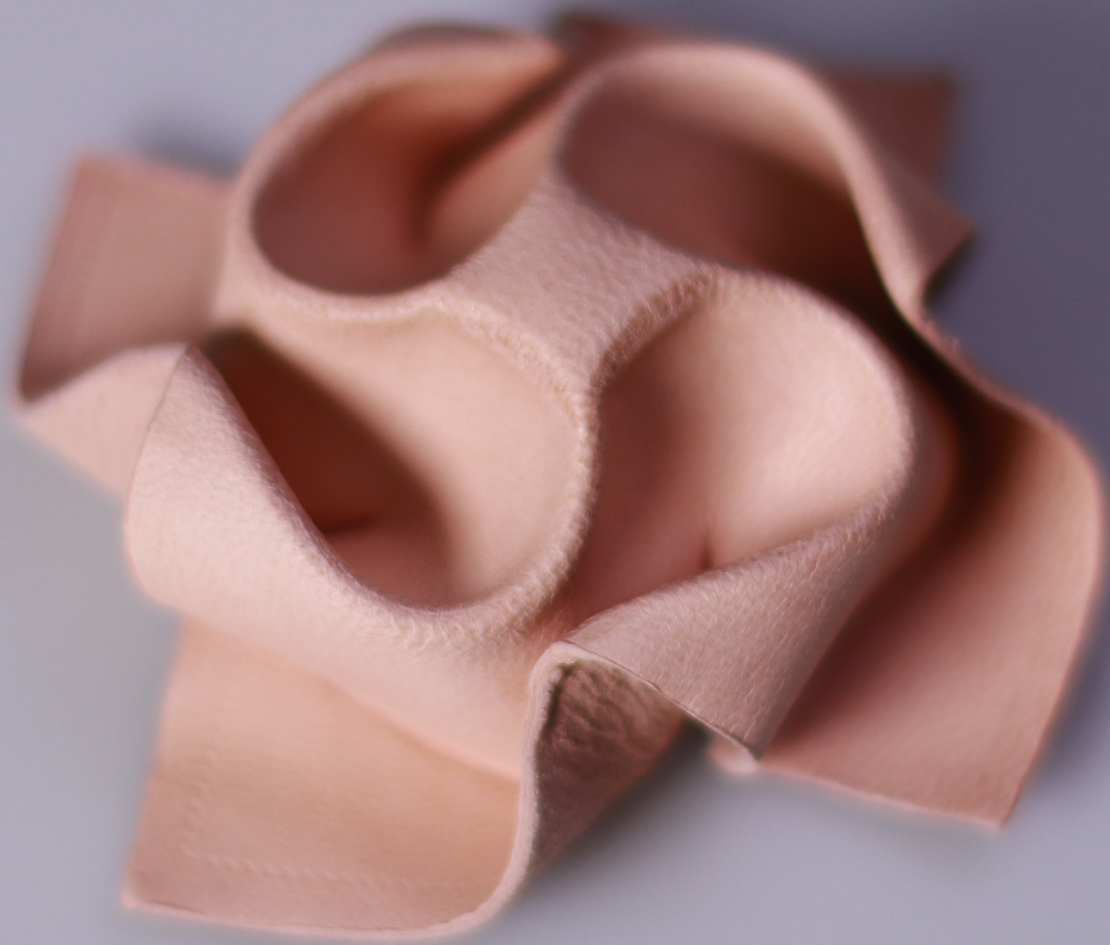
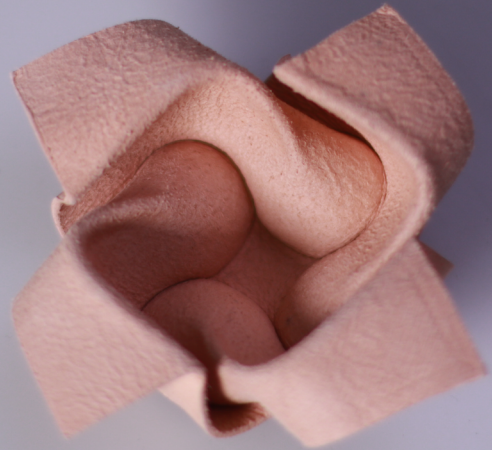


Flower

by Jun Mitani ([Mitani 2019: 65](#))

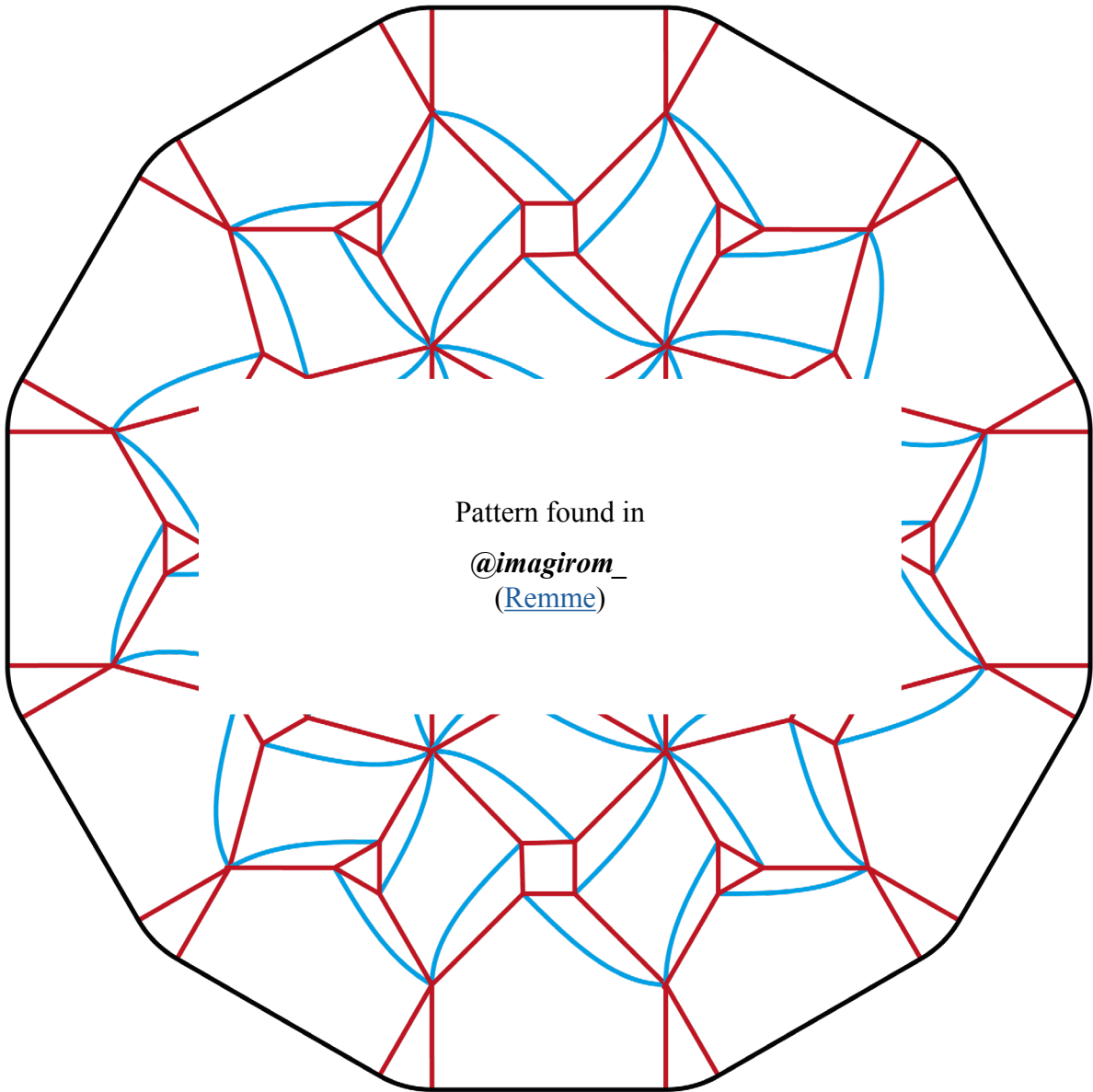


Folding Leather



Intersecting Cylinders - Gear

by Roman Remme ([Remme](#))

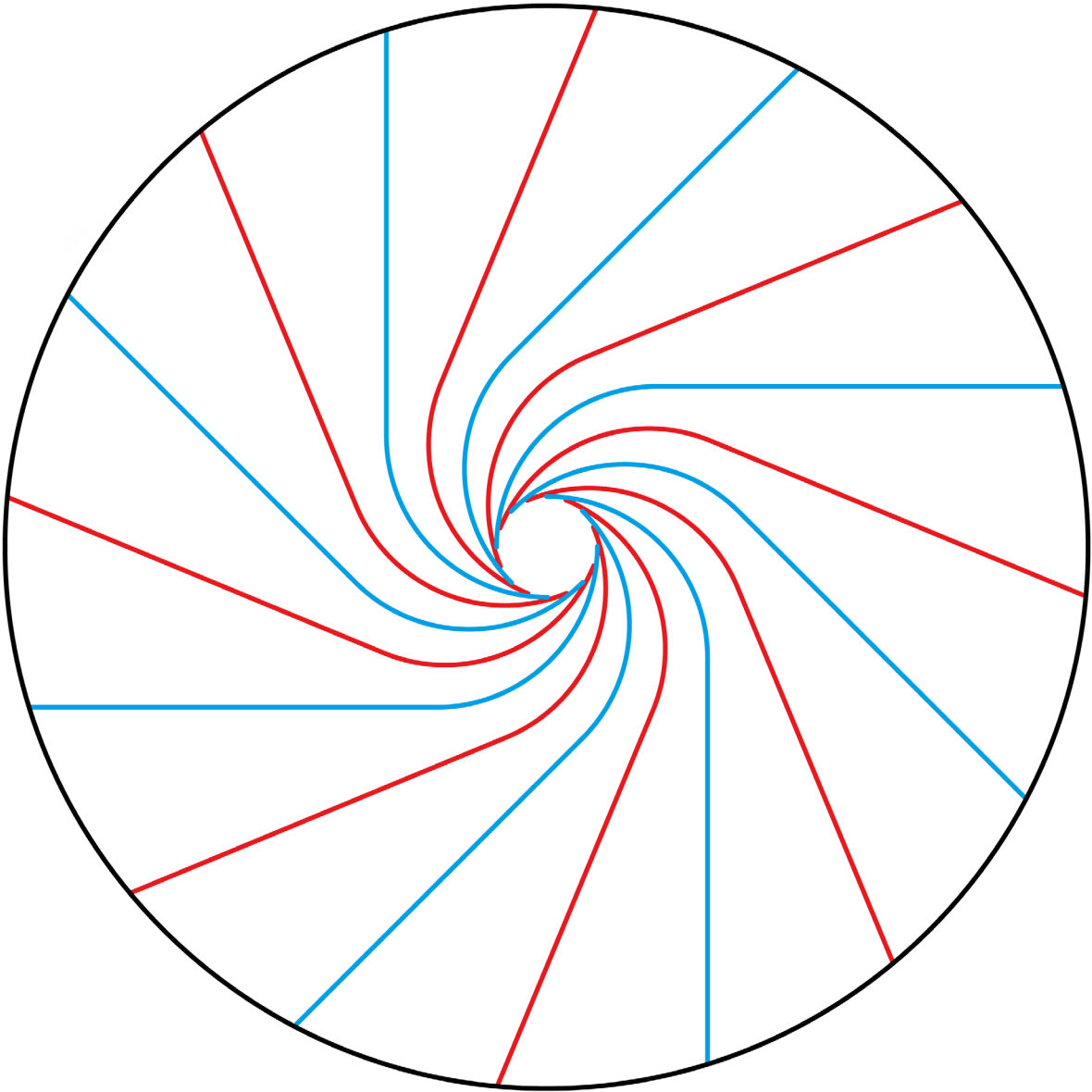


Folding Leather



Blower Spinner

Own design

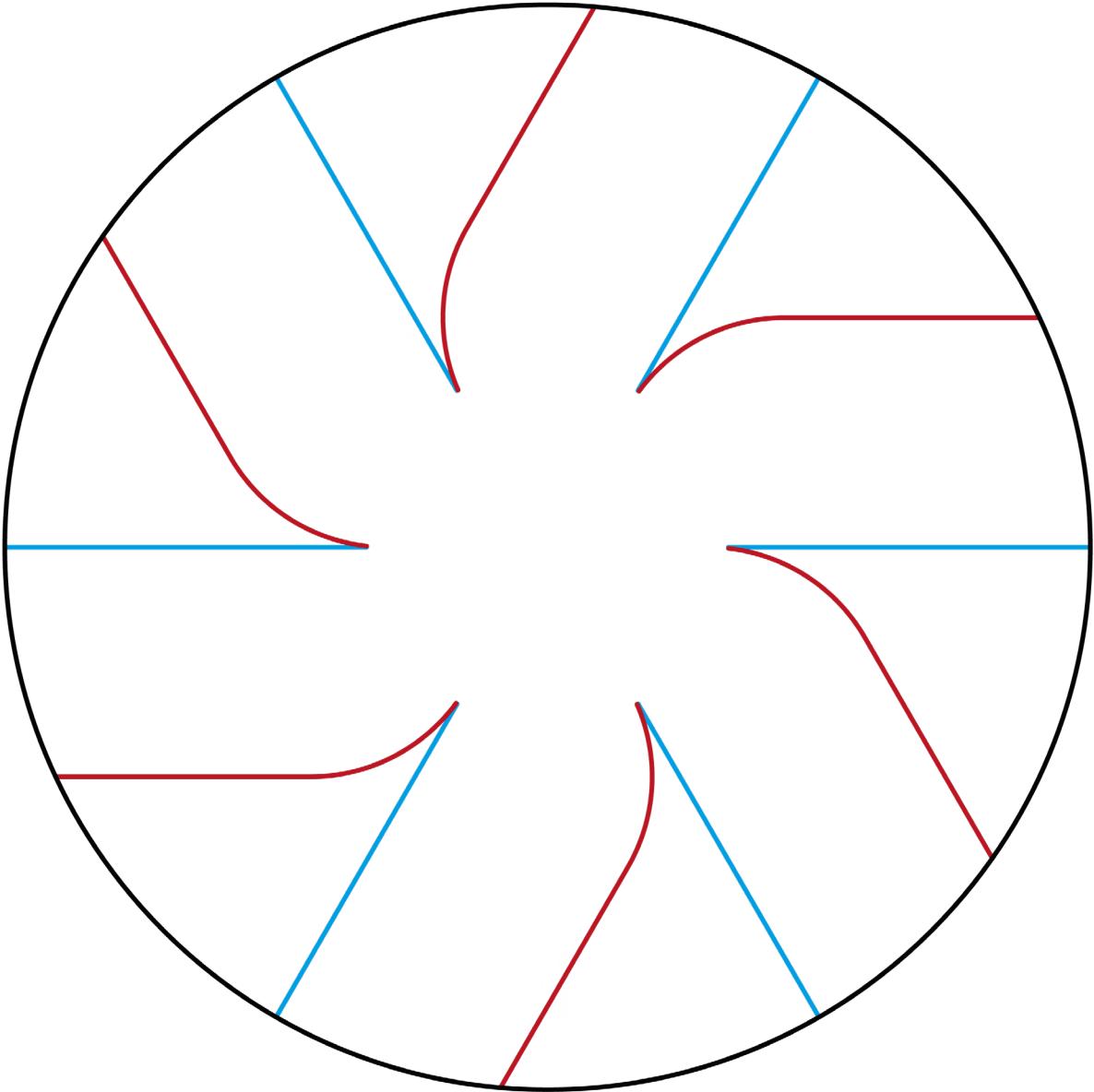


Folding Leather



Hexagonal Twisted Sphere

Own design inspired in *Japanese Apricot Flower* from Jun Mitani

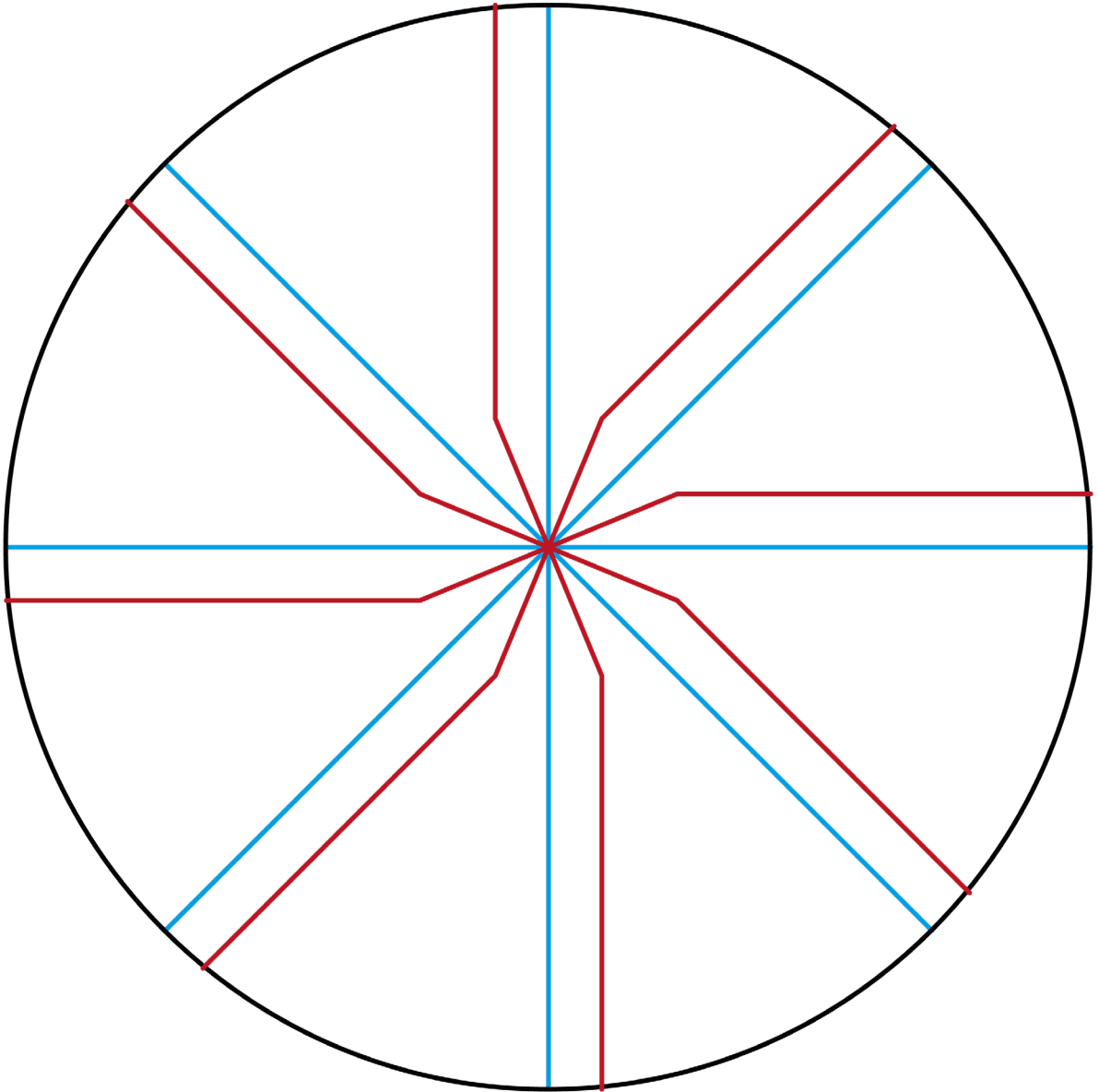


Folding Leather

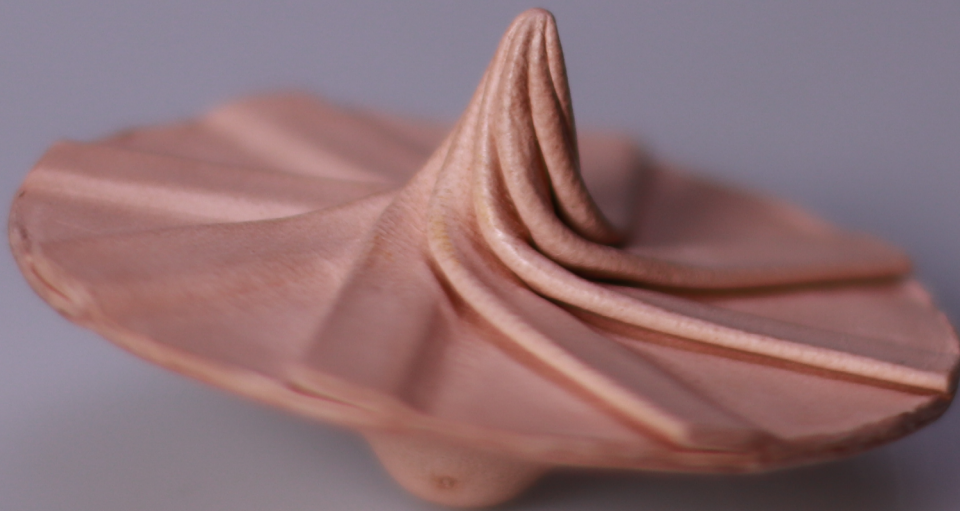
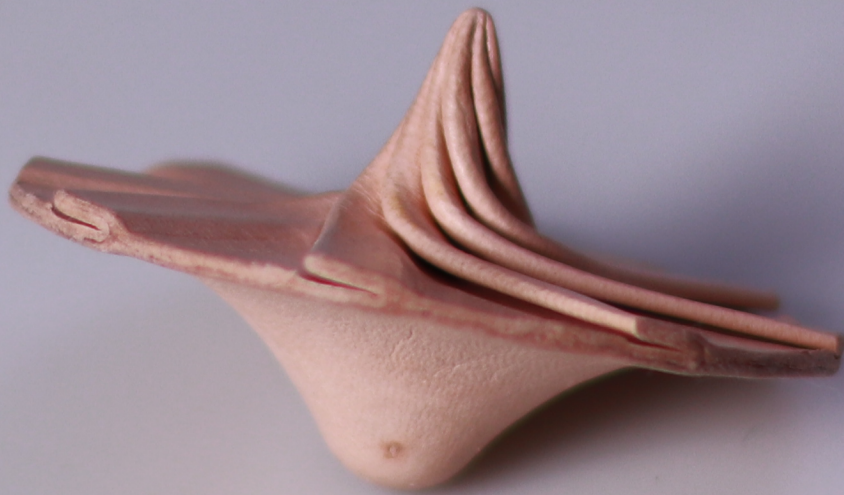
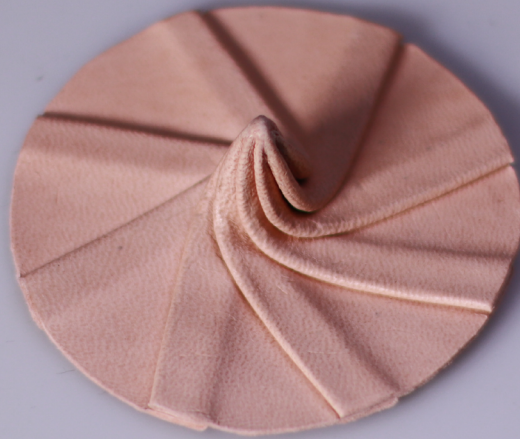


Whirl Spinning Top

Own design

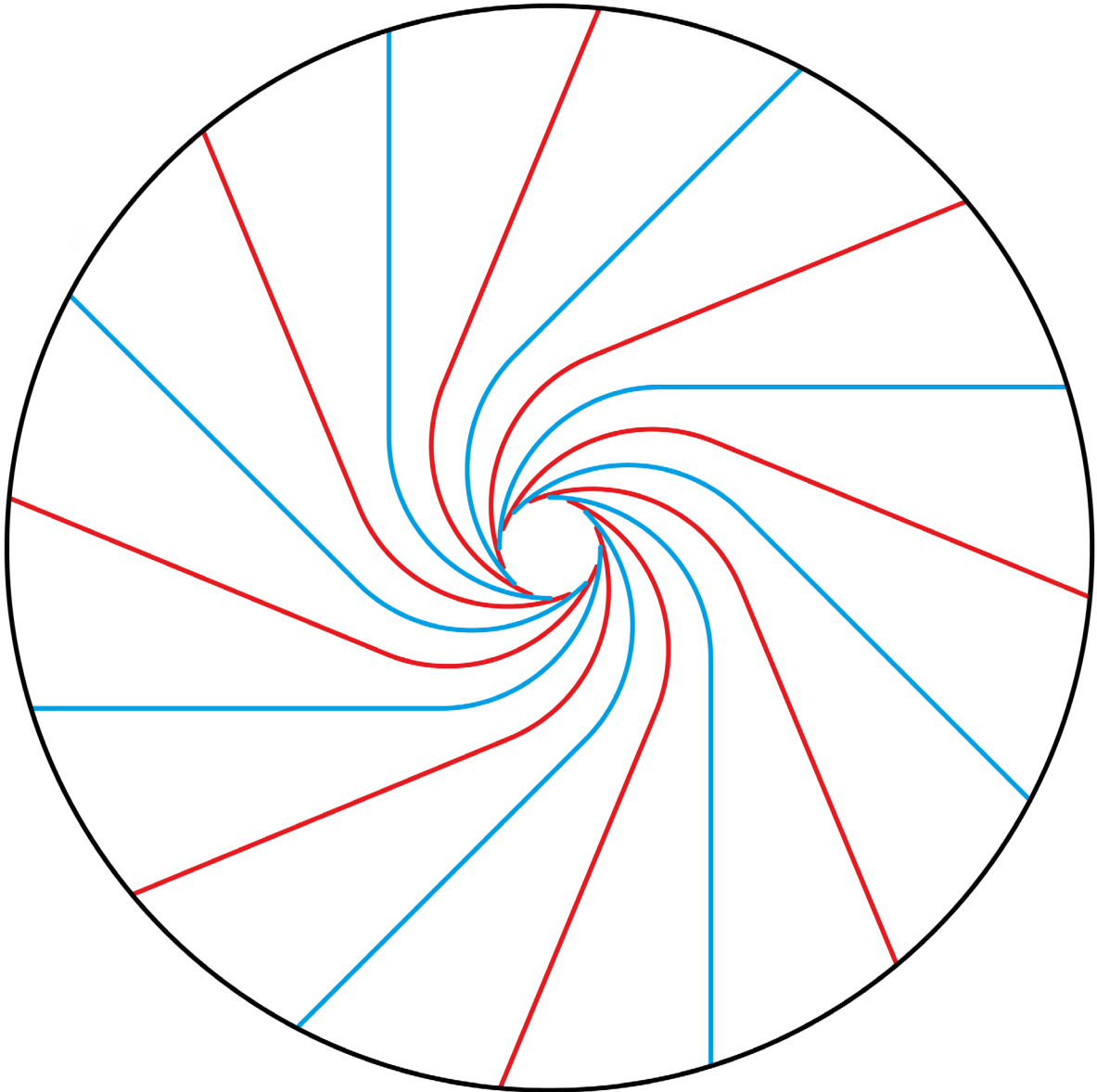


Folding Leather



Logarithmic Spinner

Own design inspired in Ekaterina Lukasheva's spirals



Folding Leather



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ANNEX 3
PAPERWOMAN

PAPERWOMAN

The tale of the Highest Mountain

by Sigrid Barranco Ballonga

Sigrid, the *paper woman*, that's her. A girl with an unusual name in her land. How did she end up with that name? It's a long story about an old comic book and a warrior princess on its inside. And, how did she end up in here? Maybe it was the destiny of her name or just a simple coincidence but here is where the story punctually ends. One girl, with a yellow winter jacket, in a new land surrounded by flooding darkness. A paper woman staggering forward trying not to soak into the water with one and only idea: finding herself. But, in order to understand this story, I will start from the beginning.

'THE CAPTAIN THUNDER: THE STORY OF SIGRID

In Erik's Castle a colossal battle occurred, in which Captain Thunder and his friends were victorious. Gundar and the captain chased Erik who was carrying Sigrid with him. Erik placed the girl on a catapult with the intention of sending her to the space... But the captain jumped over the catapult at the same time of the shoot! He and Sigrid were thrown away to a terrible distance, falling into the sea. Gundar fights with Erik, beating him... And meanwhile, in the sea, the captain and the girl are attacked by dreadful sharks!

...

Which new secret will the dying Ragnar reveal to the beautiful Sigrid? Don't stop reading the next and exciting episode, titled: NEW DANGERS!'^[1]

'Dinner time!' screamed a female voice coming from the end of the hall.

A girl closed her comic book and jumped from the bed running to the dinner table. At the same time, two kilometers away, a boy wrote the name of Sigrid on a scrap of paper which saved it inside the old book and went to sleep. They didn't know yet, but that name was already written in their minds. Twenty years later, they met for the first time on an epic adventure in the mountains. It was New Year's Eve in a small village located in a magnificent valley. They discovered the secrets of the rock giants and enjoyed their company.

One day, the boy shared with the girl his childhood favorite comic book. The inert piece of paper, which was waiting patiently inside the book, fell to the ground. The girl picked it up, read it, looked at the boy and smiled. Then, she placed it on the table. An idea was determined; a shared feeling was

^[1] Fragment of episode no.20 of the Spanish comic book *El Capitán Trueno* ([Mora Pujadas](#)).

materialized. Over that night, the paper started to slightly mutate magically. Next day, the couple noticed the change and understood how special it was. They decided to take care of it and share their love with. In the beginning, they were cautious and careful. Afraid of changing its nature they treated it like a piece of art in a museum. In the first 18 years, the paper didn't change much in shape or nature. It was a usual cellulose fiber converted into a flat sheet. The importance of its existence resided in their creators and the thought they put into their creation and caring. But soon they understood change was part of its existence. They allowed her to try different colors and textures, finishes and materials.

Maybe, its making process, her story behind, was longer than the majority of its equals but her value was additionally perceived. As soon as she realized it, she started to fold in straight and precise lines emerging from one big line. Finally, she was able to keep creating herself on her own. Mountains and valleys emerged on its surface. Some imperfections and unfinished ways decided to show up but, in the end, they result in imperceptible marks. The girl was more confused than frightened, why was she changing drastically now? Despite this, she was feeling more complete and was starting to comprehend its nature more deeply. She had more answers and, at the same time, more doubts. Soon, she was able to slightly fly. With her new shape, she jumped into the new unknown leaving the known paused. Then, she understood the relevance of relations with others and the context around. She converted the straight lines into curves and loops. Some of them linked to other papers, and others, were part of successive foldings which offered more resistance. Apparently not strong enough to hold her when a sudden gust of wind flew her back to her origin. Maybe, her desire of coming back wasn't noticed, but she was anxious to share her experiences with her surroundings. The big line was starting to split in several branches forming her own base shape. Her core was created. She understood her past, where she came from, what she was, and how she wanted to be. But she didn't know any details. Those details were continuously changing. The base was important, but the details could decide the entire final result. One change and she would turn completely different. Was it an existential crisis or a huge opportunity?

In the middle of this doubt, she recalled an old bedtime story her parents always used to tell her. A story about the highest mountain of the farthest north of the north in the inhospitable end of the world.

'In the highest part of the highest mountain everyone can find their destiny to fully complete their own identity.' the book said.

A new choice was made, and a new fold too. She was determined to climb the mountain in order to find her details. She was aware of the difficulty she was facing but she was counting on three powers which she acquired in the past:

The **first** one was the **power of thinking**. This power had the ability to understand herself and the others. It took her 8 equinoxes to develop and introduced her to the rest of the powers. It came with some brushes of the power of creating.

The **second** one was the **power of showing**. It took her 4 equinoxes and it had the characteristic of understanding the story behind.

And the **third** one: the **power of creating**, that allowed the person who possessed it to understand the value of the process behind. She already had a previous superficial knowledge of it, that is why this power was the weakest on her.

She was expecting the three powers to help her in her goal of climbing the mountain and finally finding her detailed shape. But she was not aware of all the expectant obstacles along the way. Finding the mountain was easy, she just had to go to the end of the world in the farthest north of the north; just as the instructions written in the book said. The first obstacle came in the base of the mountain.

THE FEAR OF CREATING

She stopped in front of a sign with two arrows indicating two ways, but no words written. The paper woman suddenly realized a piece of paper in which some words appeared magically:

'Write something'

'I need to find the right way to the top of the highest mountain. How can I know it?' she wrote with a pencil she always carried with her.

'Draw something'

'But I don't know how to draw' she replied.

'What is your fear?'

'Not to draw properly' she answered.

'Why did you write when I asked you to do it if you are not an excellent typographer?'

'Because I have been writing all my life. I feel confident writing.'

'Nobody was born knowing how to draw or how to write. Did you draw when you were 5 years old? Did you start drawing before writing?'^[2]

'Yes, of course.' she affirmed.

'Then, why did you stop drawing?'

No answer was written. Instead, the paper woman used her thoughts and drew a line.

^[2] Examples by the Spanish illustrator Puño for MAD 2011 talk ([Puño](#)).

Instantly, the right way was shown, and the girl preceded her journey. Step by step, she replayed in her mind what had just happened. In that moment, she felt powerful and thought that her comfort zone was too easy to stay in.

THE THOUGHT OF CREATING

The second obstacle came in the form of a very tall wall. The path continued behind it. The only way to keep going was to cross it but it was made of thick stones that reached the sky; the end was imperceptible. The only hint it was written in the wall was:

'Draw.'

There was no paper to draw on, so she decided to draw the same line, as in the previous proof, on the wall. The line transformed into words:

'What? Where? Why?'

'No intention, no solution.'

This time, the girl was sure about the solution. She took her pencil and drew an arc on the wall. The arc instantly disappeared. She tried with a door, a window... She even added more details into the sketches, but the drawings were continuously erased. When she was about to surrender another message appeared on the wall:

'Remember what you learnt.'

'The key of art is doing what we don't know how to do, because what we know how to do is already done. And the one who does what he can do, is wasting his time.'^[3]

Then, the girl drew the imaginary path behind the wall and the big barrier of stones vanished. The intention was not to cross the wall but to follow her goal.

At this point, she was already halfway of her journey and she had learnt the intention of creation. The same intention her father placed by writing her name in that piece of paper 34 years ago, or when her mother found the paper in that old comic book and both decided to take care of her.

THE IMAGINATION and THE JOY OF THE PROCESS

Lost in her thoughts, she stepped inadvertently in a puddle. She looked forward and realized she had entered a swampy area. She looked back to the puddle and saw a message on the reflection of the moldy water:

'Face the problem with no judgment.'

^[3] Quote by the Spanish sculptor Eduardo Chillida ([MundoInteractivo S.A.](#)).

Every puddle she stepped on, trying to escape, had a new message:

'Your brain is free.'

'Take and transform.'

'Have fun.'

'Enjoy the journey.'

The last message was:

'Remember what you learned along the way.'

The girl was confused and frightened. Paper and water don't get on well. She couldn't think or enjoy. She was about to dissolve; it was her end. In that moment, when she was about to give up, she recalled the moment when their parents stopped treating her like a piece of art in a museum and set her free to be.

'When something is against you, make it yours.' once advised her mother.

The paper woman thought she could escape by flying, but she already had that skill; it would be the easiest way out. In this case, she decided to use the power of thinking and creating at the same time. She folded her corners into a pair of skis, with a waterproof layer behind, and slid over the bog. Quickly, when she gained more confidence, she gradually transformed her appearance offering less air resistance allowing her to do pirouettes and to enjoy her new ability. At this point, she had overcome the two obstacles realizing the limitless power of *'to be'* and the concept of creativity as a muscle that needs to be exercised constantly to be maintained.

Continuing her path, she felt calm. It started to rain, and she suffered a transformation to protect herself from the drops by recovering her capacity of adapting to the circumstances and by noticing the value of her materiality. Her composition allowed her to achieve her momentary aim. Then, she noticed the materiality of her surroundings. She touched the wet grass, hugged the trunks of the trees and listened to the sound of the raindrops falling on the leaves. It was a matter of senses, of reaching the others through feelings.

*THE ESSENCE AND THE PHYSICAL MEANING and THE CONCEPT OF RELATIONS
AROUND AND ITS CONTEXT*

This lesson wasn't an obstacle or a proof, but an experience to reflect on. At the end of the path, she understood the power of the material meaning in relation with the feeling, the function and other fields. Nothing is isolated.

'Think as an artisan instead of an artist.' was written in a big curtain of water that was blocking her path.

She took a big leaf from the ground, folded it as a hat and used it in order not to dissolve her ideas. She crossed the curtain and reached the top of the mountain.

An old paper crane was settled on a rock. The paper woman reached the crane and said:

‘I have climbed highest mountain of the farthest north of the north to find my destiny and fully complete my own identity.’

The paper crane, Orizuru, opened its eyes and calmly sentenced:

‘During the ascension, you have surpassed the fear of creating, you have learned the need of the intention, you have known the limitlessness of imagination, you have understood the joy of the journey and you have appreciated the essence and relations between.’ the crane continued. ‘Now, the last truth is to share it. End your way by showing it. If you don’t share what you do the spirit of it dies. Use your power for this final task.’

‘But I haven’t found my final shape yet.’ she argued.

‘Don’t you realize? You have changed yourself in the journey. *If you are not busy being born; you are busy dying.*^[4] The way doesn’t lead to an end but a start. Discover the art to tell. Soon, you will understand.’

The paper crane closed its eyes and stood immutable.

The girl was confused. She returned home and told her acquaintances what had happened. She couldn’t make them emphasize with the story, but they gave her all their support.

One night, the paper woman dreamed about the words the crane told her. At that moment, she understood what was to be done. She went to the shelf, sneaked into the old comic book and used her last power: the **power of telling**.

Next morning, their parents looked for her all over the house, but they couldn’t find her. Her mum was so sad that she decided to pick up the old comic book from the shelf with the last hope to find the same piece of paper she found 24 years ago. When she opened the book, she didn’t find what she expected but found the answer. She called her partner:

‘Look.’ pointing to the title of the chapter.

‘The History of Sigrid: The Adventure of the Highest Mountain.’

Both looked at each other and smiled.

^[4] Quote by the American singer-songwriter Bob Dylan ([Dylan](#)).



Fig 1: *The Captain Thunder: The story of Sigrid* ([Mora Pujadas](#)).

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