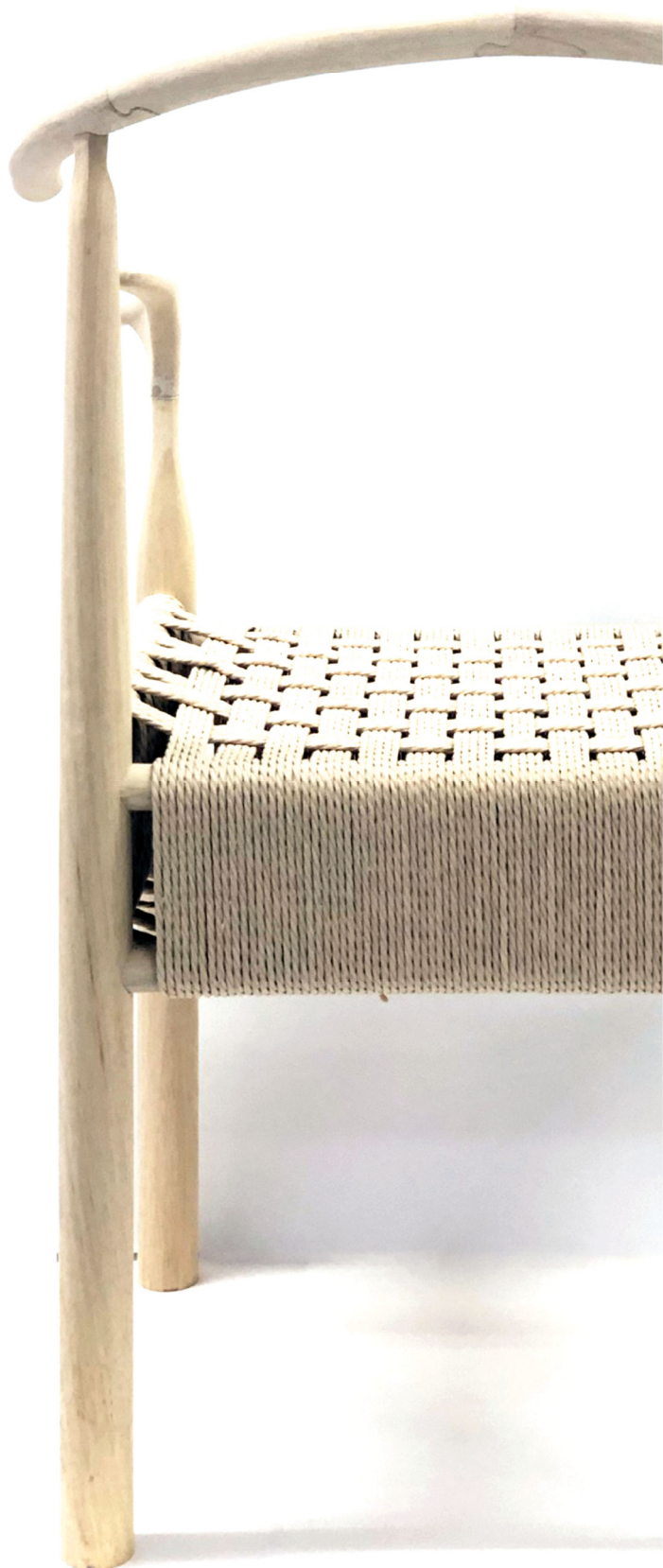
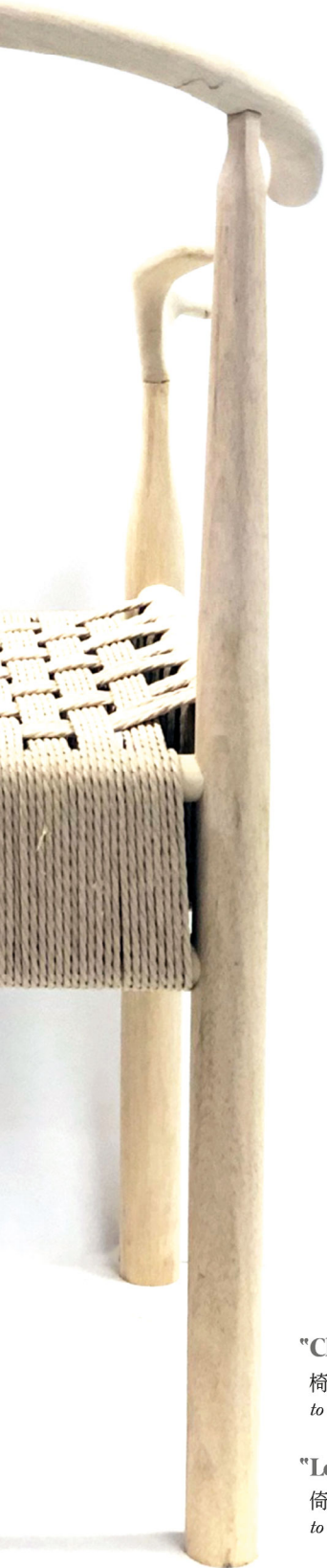


the HORSESHOE CHAIR

圈椅





"Chair" *n.*

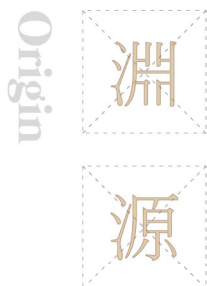
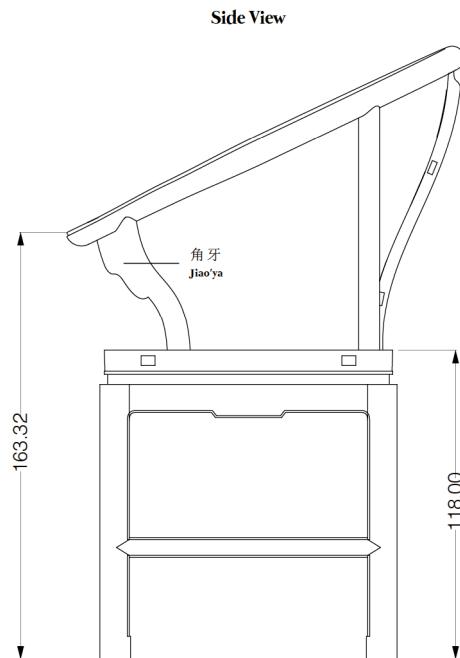
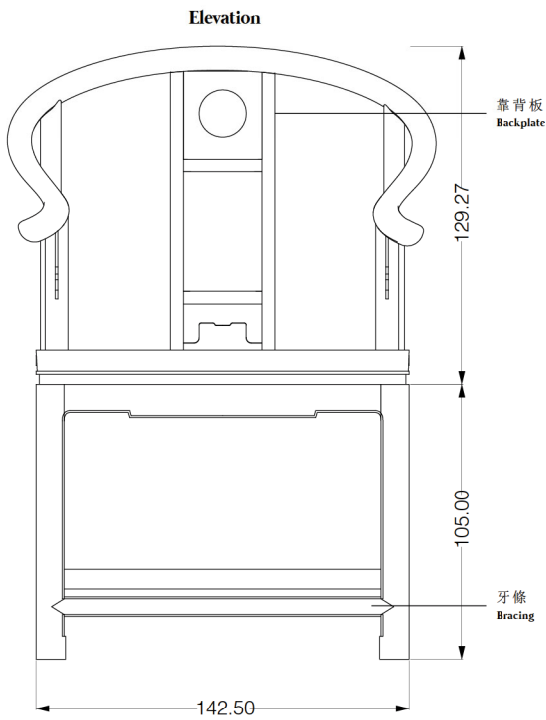
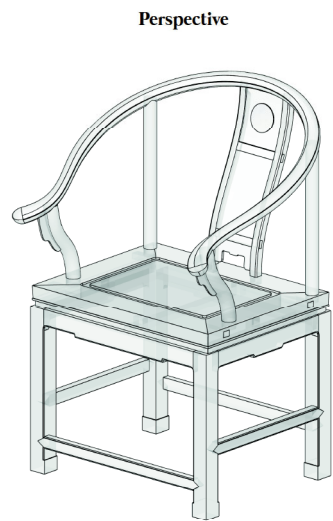
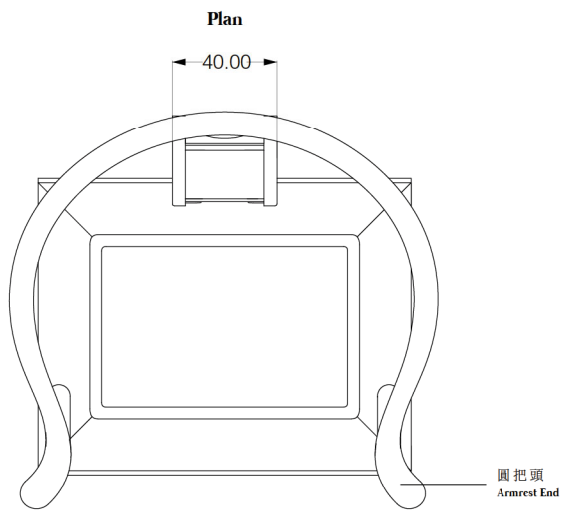
椅子
to sit on

"Lean" *v.*

倚
to lean at the back

圈椅的外形上圓下方，外圓內方，呼應中國傳統文化所重視的乾坤之說：乾為天為圓，坤為地為方。「外圓內方」在中國建築例如寺廟、四合院中廣泛應用，也是中國傳統文化中所崇尚的一種品德：在處事上有所圓滑之餘，內在仍要有所堅持。

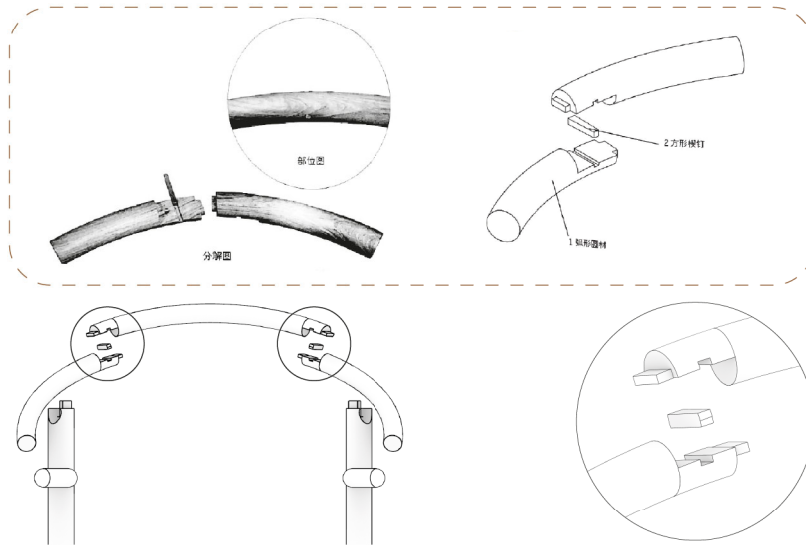
The Horseshoe Chair is curvilinear on top and rectilinear on the bottom. It echoes with the ancient Chinese belief: the round heaven and square earth. This heritage can be found everywhere in traditional Chinese architecture, including siheyuan and temples. It also implies the Chinese character, be persistent and well-rounded at the same time.



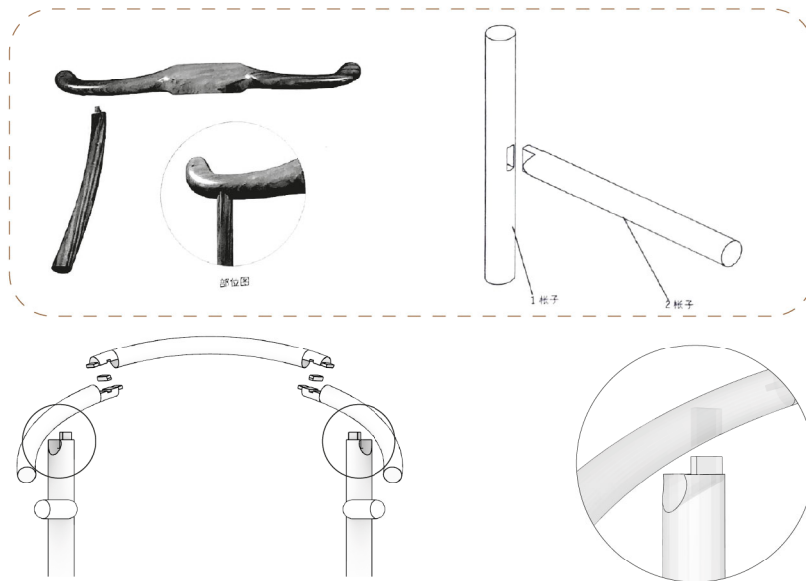
圈椅源自於唐朝。在經濟繁盛的唐代時期，貴族階層鍾情於舒服、具有優美形態和華麗裝飾的家具，圈椅因而應運而生。到了宋朝，圈椅風格變得簡潔，款色變得謙恭內斂，椅圈和座面呈現天圓地方的形態。而到了明朝，追求精神享受的文人參與了家具設計，進一步凸顯木材線條和本色，體現工匠的高超技藝。

Horseshoe chairs originated in Tang Dynasty. In the prosperous society, the nobles favoured comfortable chairs with elegant designs. It paves the way to horseshoe chairs. In Sung, chairs became more sleek and elegant. Later in the Ming Dynasty, carpenters further emphasized on the colour and quality of the wood itself.

楔釘榫接
Cogged Scarf Joint



飄肩榫接
Piao'jian Joint



「楔釘榫接」及「飄肩榫接」是在圈椅中常用的兩種重要嵌接方式。楔釘榫接是連接弧形木塊的榫卯結構，用以製作明清傢俱之彎形部件，如圈椅扶手。而飄肩榫接則是承托木椅扶手及椅背之常用結構，榫頭兩肩像飄浮的翅膀。這種做法簡單，榫頭角度一般成直角或四十五度，亦可改變榫卯角度以調整木材安裝。

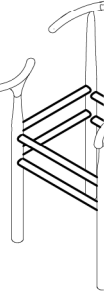
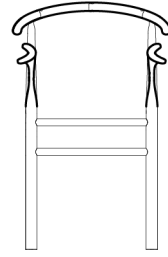
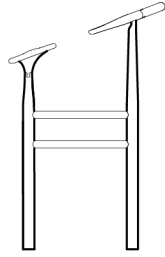
“Cogged Scarf Joint” n.

楔釘榫接
Joint for extra length

“Piao'jian Joint” n.

飄肩榫接
Joint for perpendicular pieces

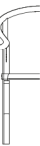
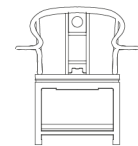
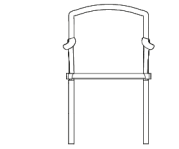
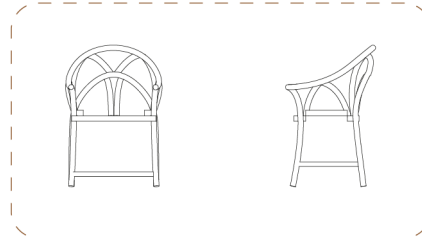
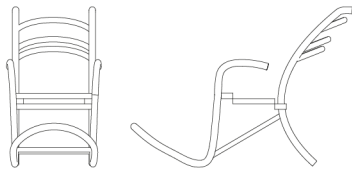
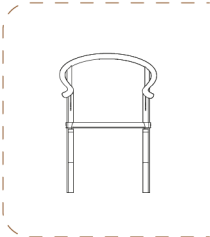
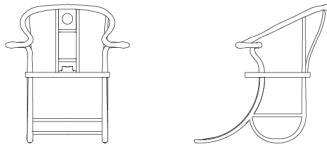
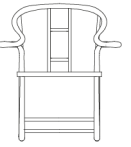
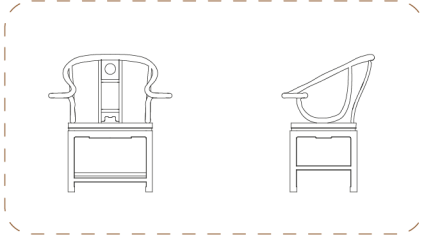
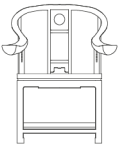
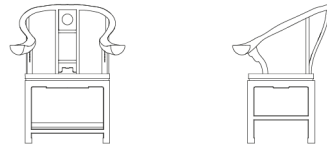
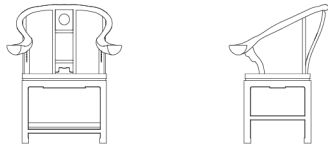
Cogged Scarf Joints and Piao'jian Joints are two dominant joints in the Horseshoe chairs. Cogged Scarf Joints are used for connecting arc-shaped blocks, such as the armrest of Horseshoe chairs. Piao'jian Joints are commonly used for supporting the floating armrest. It is a simple and flexible method of making joints of different angles.

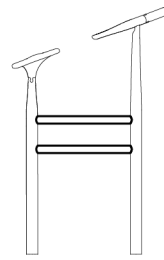
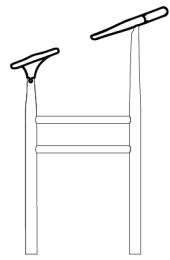
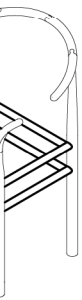


Integration of Components

Integration of Curvature

Simplification

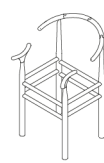
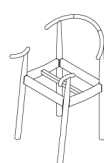
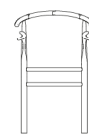
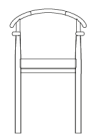
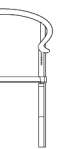
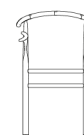
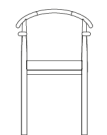
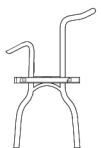
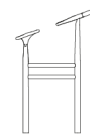
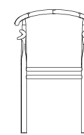
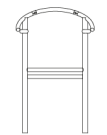
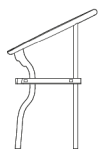
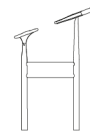
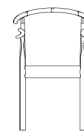
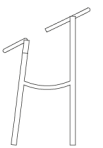
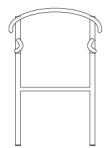
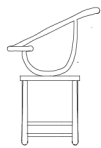
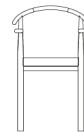
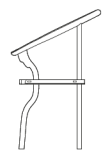
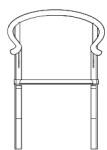
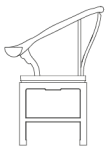


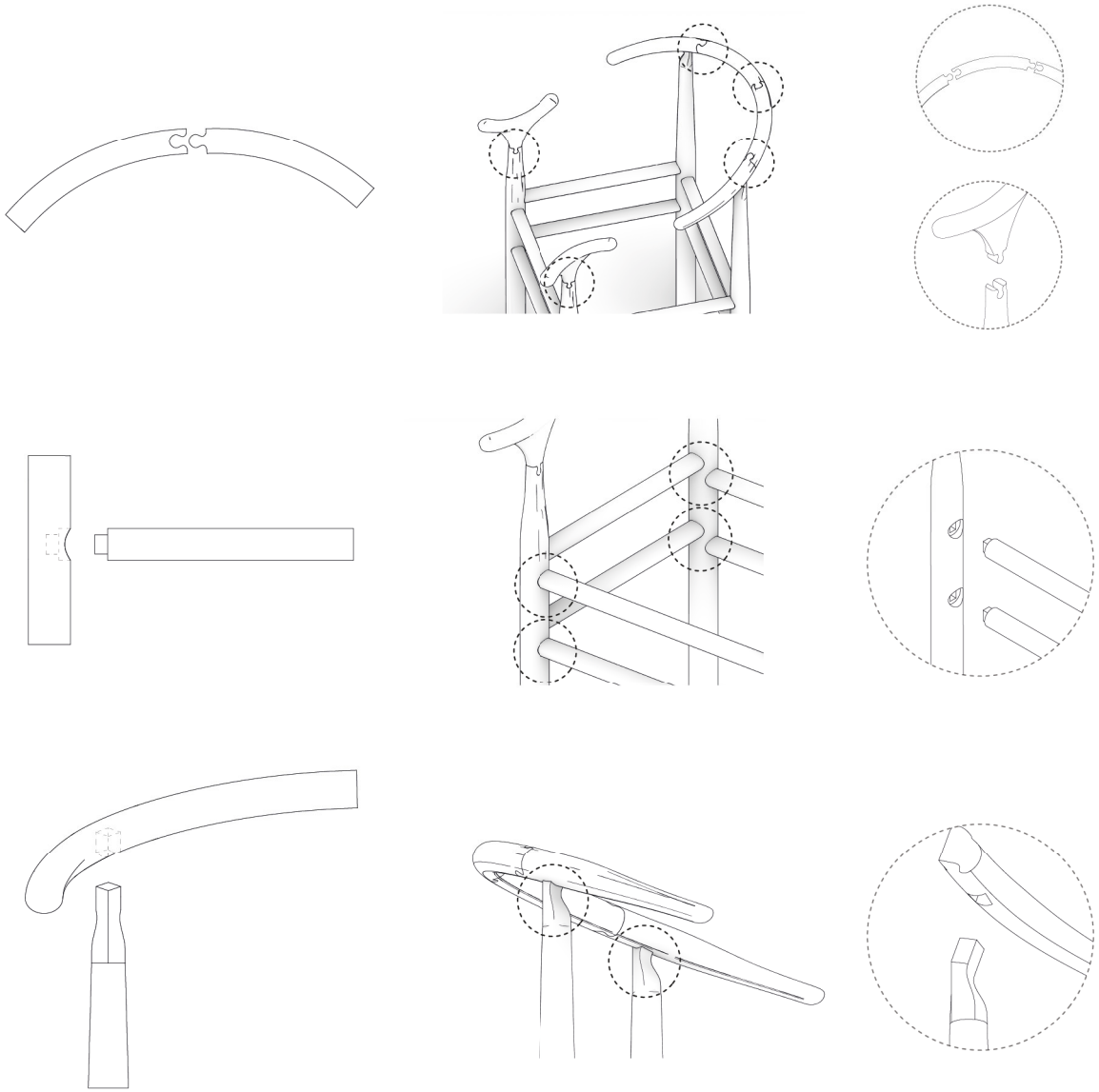


tion of Base

Breaking Armrest

Seating Support





Joint

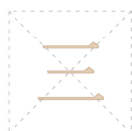


重新設計的圈椅採用了大量飄肩榫接以簡化制作程序，亦參考了「燕尾榫接」及「穿帶榫接」簡化弧形椅圈的嵌接方式。四件弧形椅圈部件及不規則形狀的把頭均採用了蹄形穿帶榫接，而承托座面的牙條則以九十度角飄肩拼合椅腳。椅圈參考原椅使用飄肩榫接承托，椅腳榫頭向前屈曲，使椅圈微斜，並確保榫槽角度可製。

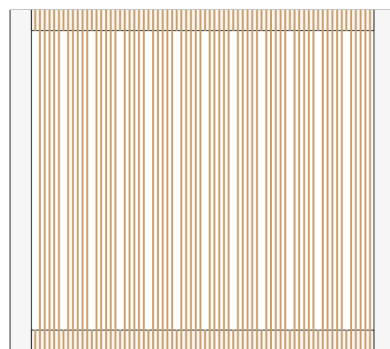
The new chair has simplified the manufacture by using a large number of Piao'jian Joints. The connection of the arc-shaped armrest and the irregular ends are replaced by Horseshoe-shaped sliding joints, while the beams and the support of armrest are made by Piao'jian joints of different angles. Bending of joint is made for the tilting armrest.



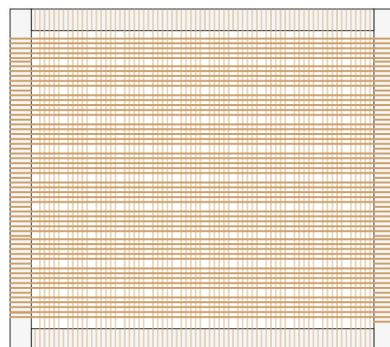
Paper · Cord · Weaving



Process



Final Product



麻繩、麻布等麻織物是人類最先製造的紡織品，但卻因粗糙的表面而被視為簡陋易穿的物料。是次選用的紙藤是種密實堅固又輕巧堅韌的天然材料，具有不怕擠壓及柔韌有彈性的特性。其光滑及白淨的表面不單改善其外觀，亦提升了編織椅墊的舒適度及耐用度。

“Weaving” *n.*

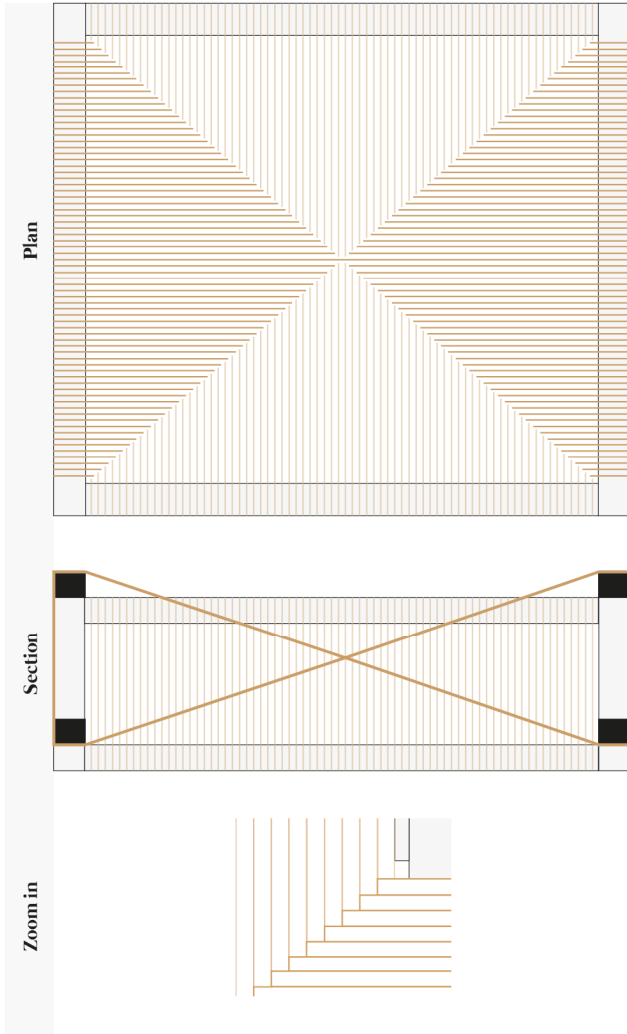
梭織
the seat

“Paper Cord” *n.*

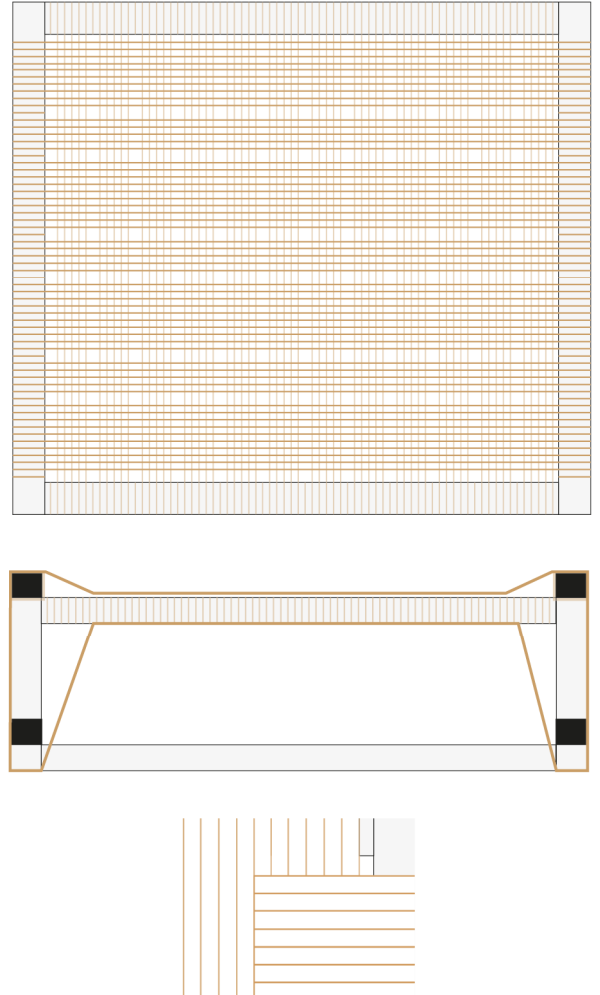
紙繩
the thread

Hemp ropes are the first weaving materials created by human, yet their rough surfaces appears to be crude and easy to break. In this furniture piece, paper cord is used because it is a more tight and light natural substitute, and are more flexible and elastic. Its smooth and white surface has greatly improved the appearance and durability of the chair.

X pattern



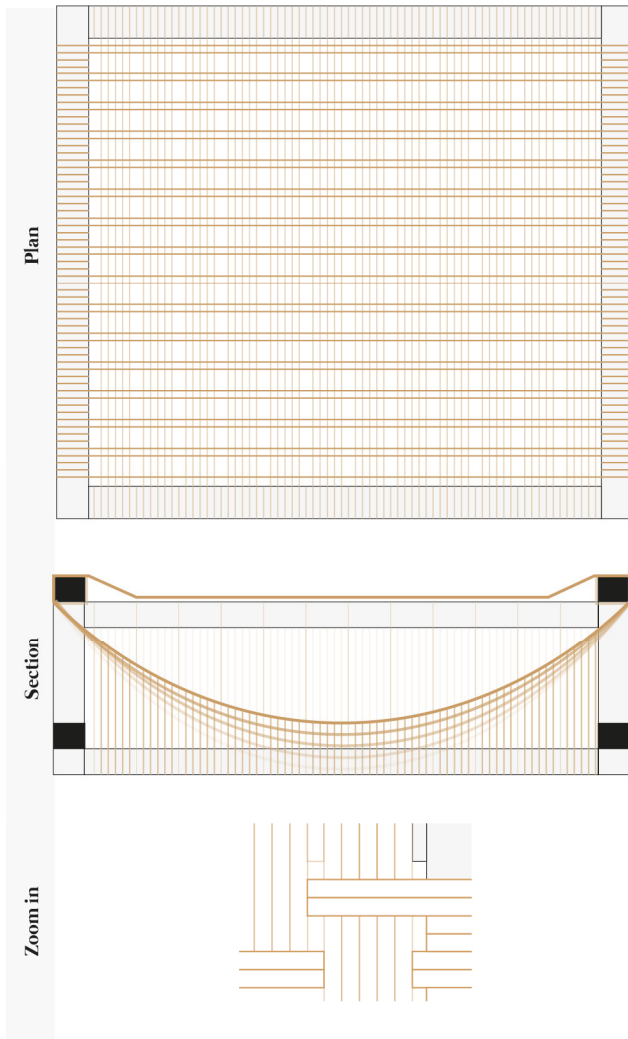
Heavy Grid Pattern



"Shuttle" *n.*
梭子
the needles

"Comb" *n.*
梳子
the fixing frame

Lighter Grid Pattern

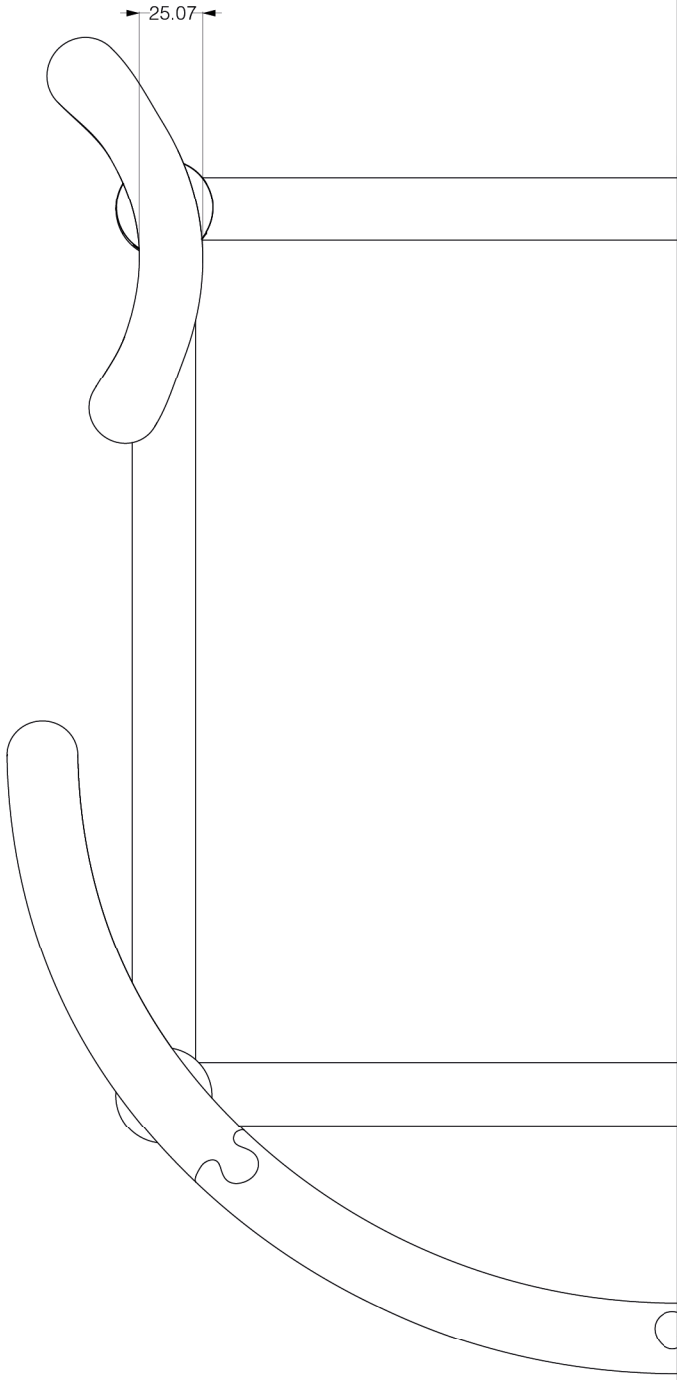


Fabrication Tools



紙繩編織首先選用了由四條樑延展到座椅中心的做法。但因座椅太深，編織座墊會凹陷而未能平均承托使用者的重量。為保厚座墊之的形象以突顯原有座架與下方牙條合併的設計，我們轉為使用梅花間竹的編織方式，保持座面水平。編織過程使用了傳統編織工具穿引紙繩，重新塑造傳統編織的藝術。

The X-pattern can highlight the seat as an extension of the four sets of beams. However, due to the exaggerated depth of our seat, this method cannot provide a flat and comfortable surface. To retain a bulk cushion gesture, we have decided to weave flat by the alternating grid method instead. Traditional tools are also used to demonstrate weaving art.



Design

設

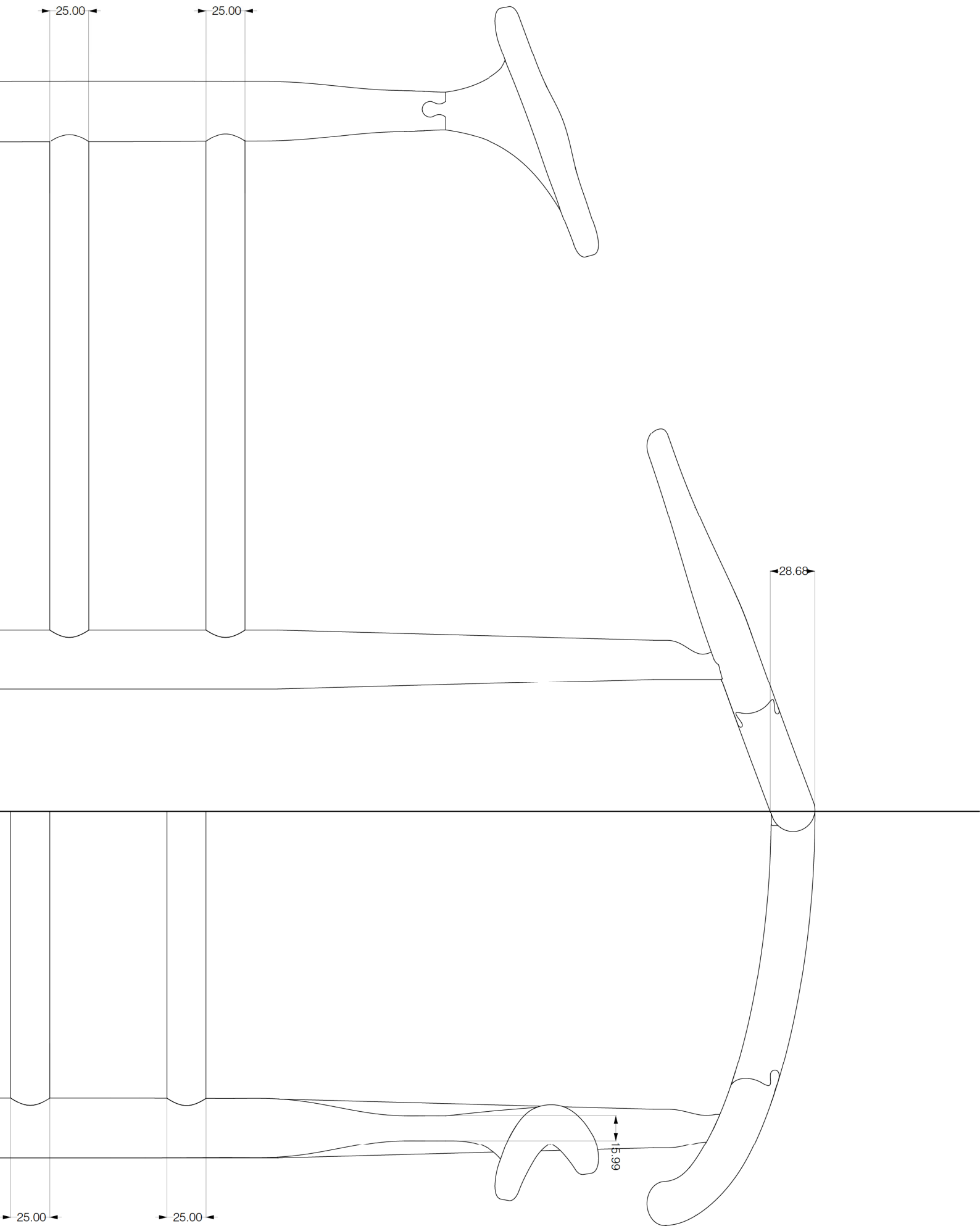
計

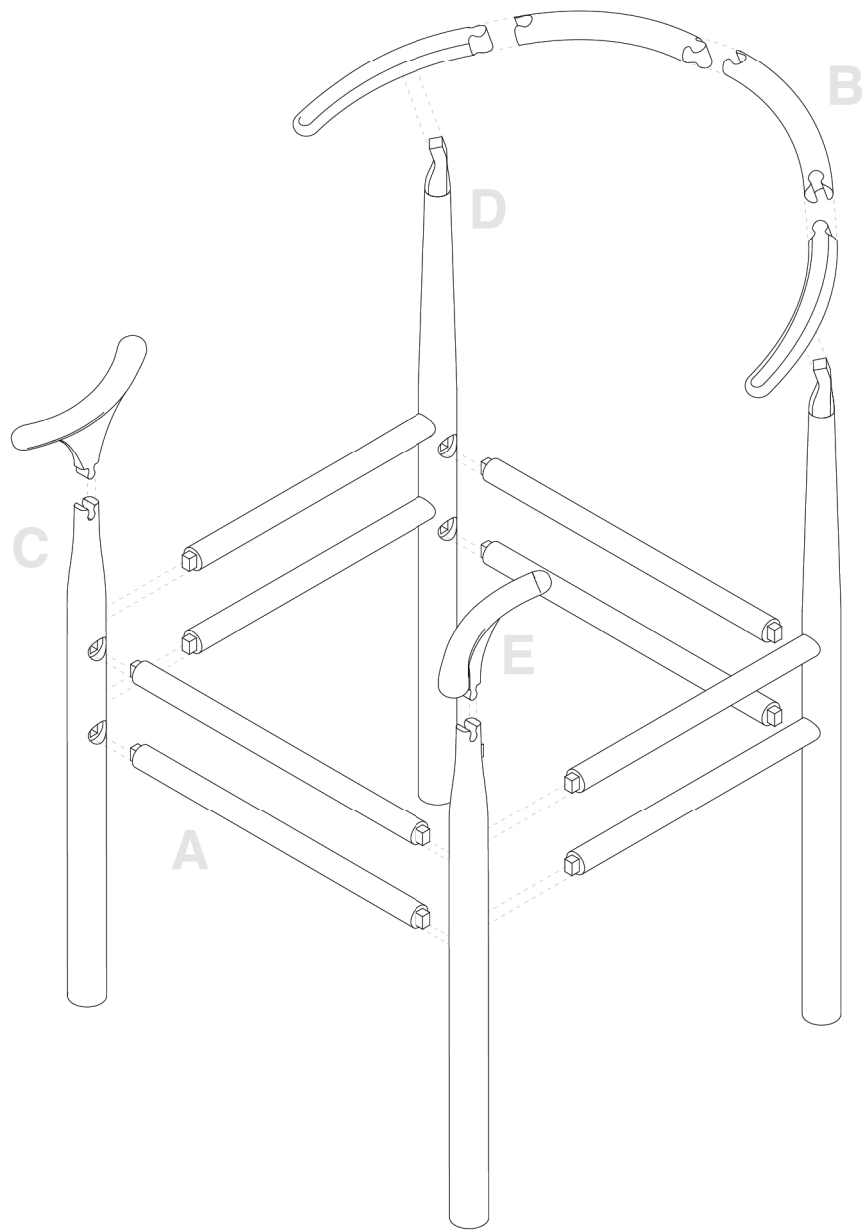
38.57

25.00

25.00

25.07





Assembly

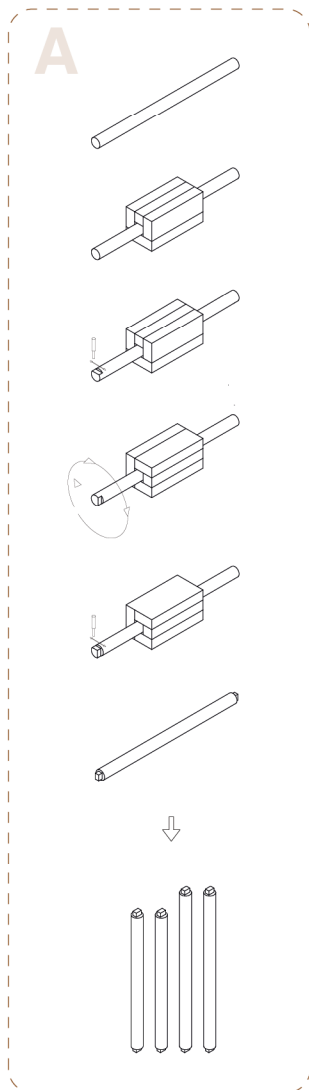
組

裝

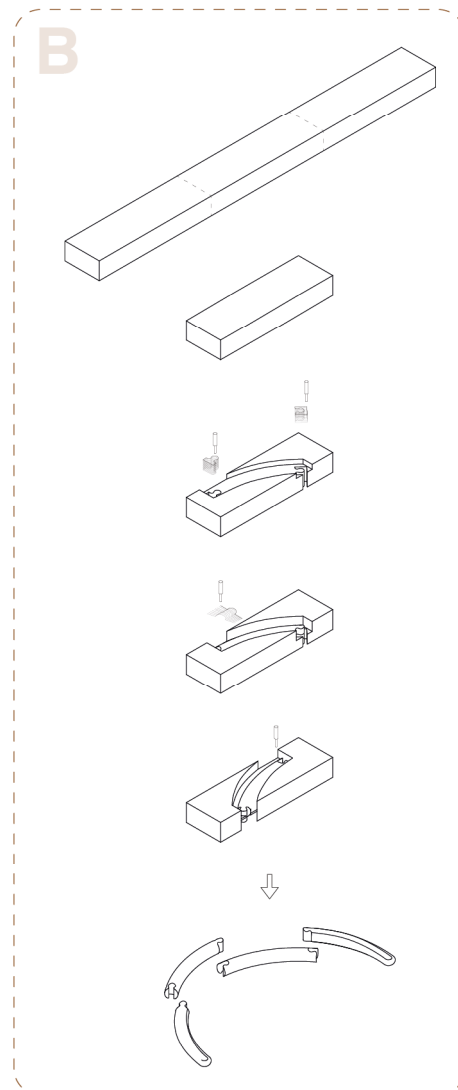
圈椅的組裝主要包括木工榫接和機器榫接兩個部分。木工榫接用於製造四對用作固定豎向部件的牙條。木工榫接製作雖然沒有機器榫接來的方便及準確，但在製作簡單的榫接上仍然具有優勢。木工榫接並不需要花費大量時間在特定電腦程式準備檔案，而且在製作過程中更易上手和操作。

The assembling process includes CNC milling and hand drilling. Although CNC milling can create more accurate joints, hand drilling is actually better at crafting simple joints. It saves time in preparing fusion files, and allow carpenters master the fabrication process easily.

木工榫接
Hand-drilling



機器榫接
CNC Milling



為簡化製作程序，四對牙條的九十度飄肩榫接以木工製作，先要製作四方夾具方便固定及旋轉圓形木材，旋轉四邊後榫頭便可完成。弧形椅背、不規則形狀把頭、椅腳的彎狀榫頭及腳身榫槽則以機器製作，可先在電腦程式模擬組裝及製作，確保部件及榫卯的大小尺寸準確。

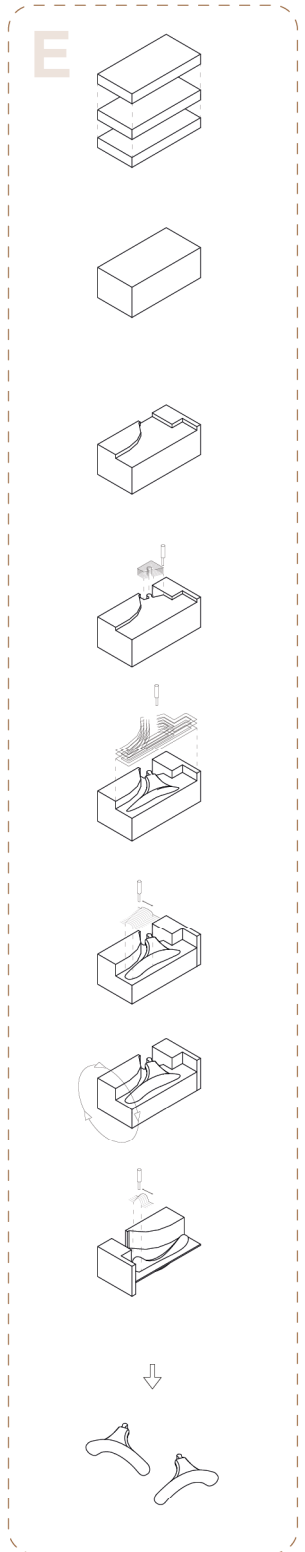
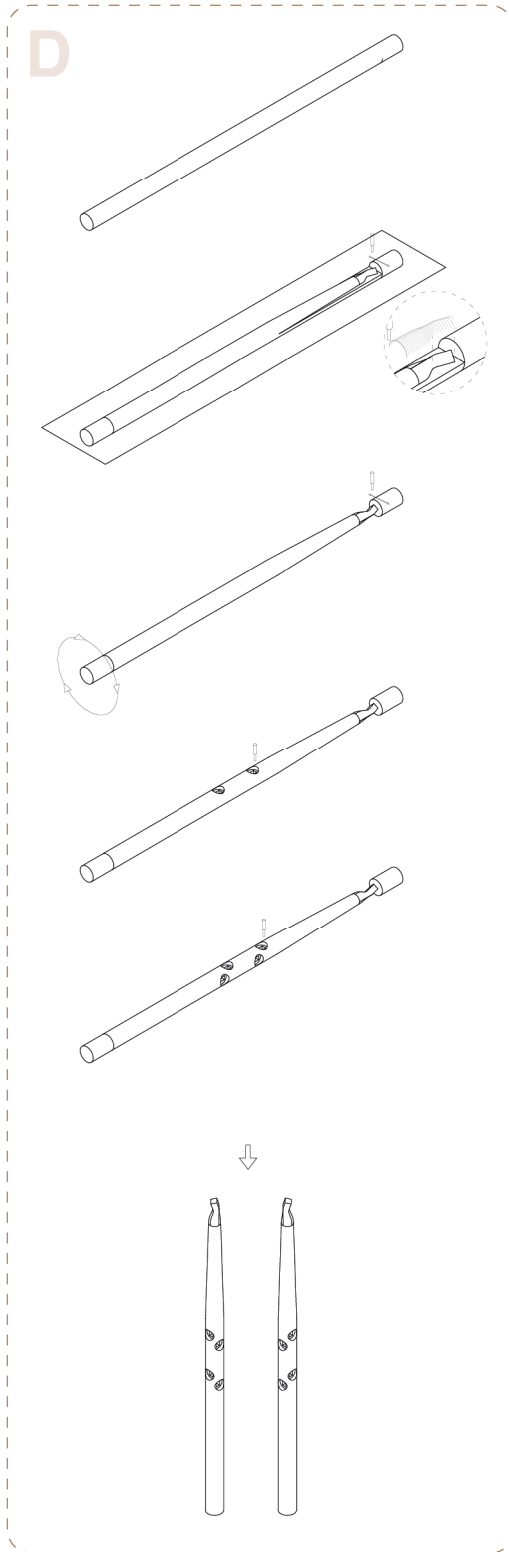
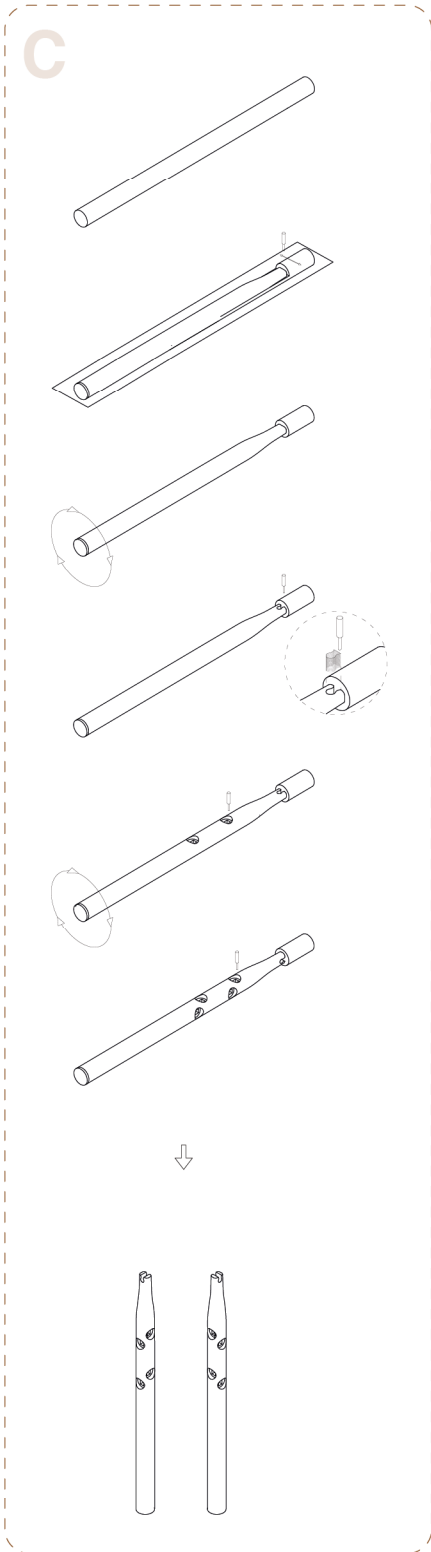
“Hand-drilling”^{n.}

木工榫接
drilling through eyeballing

“CNC Milling”^{n.}

機器榫接
drilling by machine

For a more efficient manufacture, four pairs of beams are made by hand drilling with a jig. The jig is for fixing and turning round wooden dowels. For the arc-shaped armrest, irregular armrest ends, tilted tenon at the legs and mortises along, CNC Milling is used. With simulation on softwares, the pieces are more accurately made.



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Epilogue

結

語

木製榫卯為珍貴的中國傳統工藝，無須用一口釘可以組裝多個複雜的木材部件。是次木椅製作運用當代電腦科技控制銑床，加快並挑戰傳統木工藝之製作，成功造出有機形狀的榫頭及部件。電腦技術未必會完全取締人工，而或能使木工藝技術更上一層樓。

Wooden tenon and mortise joints are precious traditional Chinese craftsmanship to assemble pieces without a single nails. In this production, computer technology is used to challenge the tradition. Organic-shaped pieces are successfully made. Traditional craftmentships may not be fully replaced by computer technologies, but instead being brought to the next level.

