

Comparative Study of Dong Embroidery and Dong Brocade Techniques in Sanjiang Dong Autonomous County

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Abstract: Based on field research, this article analyzes the techniques of Dong embroidery and Dong brocade in Sanjiang Dong Autonomous County, covering their production processes, technical essence, and modern inheritance and development. The art of Dong brocade has a long history and is known for its ingenuity, characterized by unique weaving tools and techniques. The study finds significant differences between hand embroidery and brocade in terms of craftsmanship, efficiency, sales, and cultural identity. Hand embroidery emphasizes paper-cut patterns, relying on the exquisite skills of weavers, with long production cycles and high prices, mostly used in high-end custom clothing. In contrast, brocade utilizes bamboo coding principles, offering high efficiency, suitability for industrial production, affordability, and wide application. Traditional handicrafts represent the wisdom of a nation, carrying the traditions and spirits of different ethnic groups, and possessing indispensable cultural value in traditional attire.

1. Introduction

Sanjiang Dong Autonomous County is situated at the junction of Guizhou, Guangxi, and Hunan provinces. The Dong people, one of the ancient "Baiyue" ethnic groups, possess a long tradition of cultivating ramie, hemp, mulberry, and cotton, consequently developing unique weaving and dyeing techniques[1].

The "Pangu Song" records, "Yumei set up cotton cloth, pressing seeds in the morning and spinning yarn in the evening", depicting the origin and evolution of Dong dyeing and weaving technology[2]. Due to its remote geographical location, poor transportation, and relatively limited external communication, Sanjiang Dong Autonomous County has preserved its brocade weaving techniques relatively intact. The Dong people have long used the backstrap loom (oblique loom). This traditional tool can not only weave plain and twill fabrics but also perform brocade weaving, rapidly achieving jacquard patterns through the principle of bamboo piece coding. This technique is still applied even in remote Dong villages today, fully demonstrating its practical value and

profound significance.

2. Comparison of Dong Embroidery and Brocade Techniques

Dong embroidery involves threading needles to meticulously stitch cotton or silk threads onto fabric, forming various patterns and designs. Dong brocade is woven from cotton threads dyed in five colors. The weaving techniques differ based on the tools used.

2.1 Process Comparison

2.1.1 Hand Embroidery Process

Dong embroidery originally used white thread dyed as needed, integrating dyeing, cutting, weaving and stitching. Its traditional process involves three stages: base cloth creation, paper-cutting, and embroidery technique. Artisans create the base cloth from three layers—colored lining cloth on top, coarse cloth in the middle, and base paper at the bottom—bonded with paste then dried to form a stiff, glossy foundation that stabilizes the embroidery. Paper-cutting provides the pattern foundation, as most embroidery designs originate as paper-cut shapes. During thread arrangement, artisans adjust needle direction and color combinations according to the pattern, carefully managing stitch density and turns to ensure even coverage.

2.1.2 Warping, Threading, and Picking Processes and Tools for Dong Brocade

Arranging Warp Yarns: Dong people use a warping machine to arrange and comb the warp yarns. It consists of thick bamboo poles and a warping comb, used to wind the spun yarn parallelly onto the warp beam according to the required length and width. **Threading the Heddles:** Bamboo heddles and ox rib hooks are used. The thread hook is used to pick and thread the warp yarns. **Threading and Picking Bamboo Sticks:** Used to design and arrange the brocade patterns. Dong brocade patterns are symmetrical and continuous; picking half the bamboo sticks can complete one pattern. The steps are roughly: using a picking ruler according to the pattern's code to lift all the warp yarns of the first shed. The picking ruler is passed through the gap between the lifted warp yarns and the remaining warp yarns, combing the yarn back and forth continuously. Weaver places the first bamboo stick at the heddle line and push it onto the heddle rod.

2.1.3 Process Comparison

In terms of time consumption, the Dong brocade weaving process is intricate and complex, and the loom is also key to these exquisite patterns. The preliminary preparation work takes several days to complete. The preparatory work for Dong embroidery is relatively simple, taking only minutes before beginning needlework and starting to embroider.

From a process perspective, the difference between brocade picking and embroidery lies in the fact that picking technique requires counting yarns for each pick, composed of cross-shaped right angles, generally presenting geometric decorative styles.

2.2 Technique Comparison

2.2.1 Embroidery Technique

The principle is to expand from the center of the crab pattern to the surroundings. For symmetrical paper-cut patterns, one half needs to be embroidered first. For the first pass, embroider from left to right, first using a few stitches to fix the paper-cut pattern. The stitches should have a

sense of spacing, serving a fixing function. For the second pass, embroider from right to left. The stitches need to be arranged tightly, fully covering the pattern. The embroidery should have a certain thickness without gaps.

2.2.2 Brocade Weaving Technique

When weaving Dong brocade, different patterns are formed based on the arrangement of the patterned bamboo sticks. Weaving is done on the backstrap loom, which has a complete frame and warp for delivering warp yarns. When stepping on the treadles of the loom, the heddles correspondingly lift or lower, thus achieving the interlacing of warp and weft yarns.

2.2.3 Technique Comparison

Dong brocade weaving is based on the selection of patterned bamboo sticks for weaving. Dong embroidery relies mainly on paper-cut patterns. When embroidering different parts, it is necessary to re-thread the needle and change threads of different colors, completing the embroidery piece stitch by stitch. Dong brocade shortens the time for picking and weaving the ground weft, improving weaving efficiency. Compared to Dong embroidery, the weaving speed is faster, and efficiency is higher. The pattern structure of Dong brocade presents broken lines, diagonal lines, and even curves visually. Upon close observation, the pattern structure is formed by the vertical 90° arrangement of warp and weft threads. In contrast, due to the lightness and flexibility of needlework tools, Dong embroidery patterns are mostly freeform.

3. Principles and Wisdom of the Primitive Dong Brocade Loom

3.1 Loom Structure

The Dong term for the backstrap loom is spelled as "sunge quip", pronounced as "song qiu". This is a loom that can weave both plain, twill fabrics, and jacquard fabrics. As shown in Figure 1, it can be roughly divided into four main parts based on function: loom body, yarn mounting, shedding, and beating-up. The inclined frame is 175 cm long and 140 cm wide. The body part consists of the frame, legs, and seat plate forming the entire machine skeleton.

The yarn mounting part includes the lease rod, pressure bar, warp beam cloth beam and backstrap. The lease rod is installed at the rear end of the frame, dividing the warp yarns into upper and lower layers. The warp beam separates the upper and lower layers of warp yarns, used for creating the ground pattern. The cloth beam is installed at the front of the frame, rolling the woven brocade from the outside in. The backstrap is tied around the weaver's waist. Weaving Dong brocade requires the coordinated effort of hands, feet, waist, eyes, and mind. The shedding part includes the plain weave treadle jacquard treadle, two "V"-shaped rocker arms pattern bamboo sticks picking ruler, and heddle cords. The plain weave harness controller is fixed to the frame, the plain weave treadle is fixed to the bottom of the frame, and the plain weave harness controller is connected to the plain weave treadle. The jacquard mechanism is installed on the upper end of the loom head, the jacquard treadle is installed at the bottom of the loom head, and the jacquard mechanism is connected to the jacquard treadle. The heddle rod divides the heddle cords into front and rear layers. The pattern bamboo sticks are wound around the jacquard heddle rod[3]. The beating-up part includes the reed, picking ruler, and wooden sword-like shuttle. The reed is comb-shaped and serves to comb the yarns.

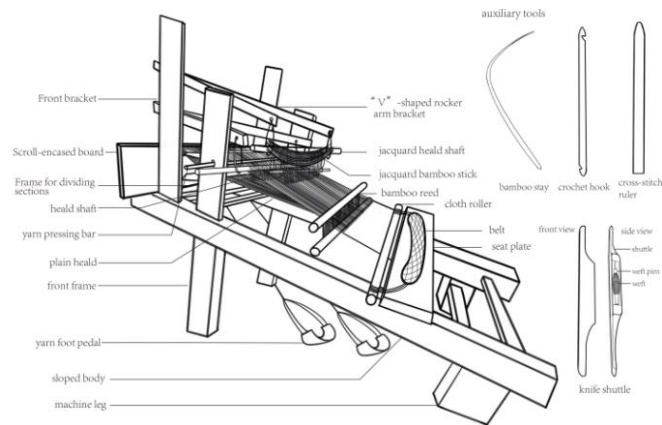


Figure 1: Backstrap loom and its structural diagram

3.2 Symbolic Coding of Bamboo Sticks

The "Eight Petal Flower" pattern in Dong brocade weaving uses over 540 warp threads. The backstrap loom employs a foot-operated heddle lifting device to form the shed. When the weaver presses the jacquard treadle, the connected jacquard picker makes the heddle cords move up and down, creating a triangular shed that facilitates weft insertion and beating with both hands. The complete set of pattern bamboo sticks acts as a jacquard information storage system, resembling a bamboo pattern chain. Figure 2 illustrates the coding process for this pattern: the weaver uses a picking ruler to select warp threads according to the design, placing those corresponding to white squares above the ruler and pressing those for black squares below it from right to left, repeating this sequence step by step. Finally, the weaver inserts the wooden sword shuttle into the arranged warp threads.



Figure 2: Backstrap loom encoding principle

After inserting the wooden sword shuttle, the weaver removes the picking ruler to widen the gap between the upper and lower warp layers. The weaver then reinserts the picking ruler into the upper end of the reed and slides it along the jacquard heddle cords to fully separate the two warp layers. Next, the weaver threads the picking ruler through the middle of the jacquard heddle cords, fastens the heddle separation rod and picking ruler together, and presses the jacquard treadle with the right foot to tension the warp threads and heddle cords. The weaver inserts the pattern bamboo stick into the intersection of the jacquard heddle cords and moves it up and down to form a triangular forked opening. The bamboo stick is then inserted into this opening behind the heddle separation rod, pulled upward toward the pattern bamboo stick, and secured with bamboo strips on both sides, completing the coding for one pattern bamboo stick. The weaver repeats these steps to code the entire set of pattern bamboo sticks.

3.3 Coding Process of the Backstrap Loom

3.3.1 Brocade Weaving Principle

Dong brocade is woven on a backstrap loom whose core technology involves pattern bamboo sticks that serve as encoded jacquard patterns. Warp threads pass through two heddle rods for plain weave and pattern weave, with the plain heddle controlling lower warps and the pattern heddle selecting upper and lower warps. The weaver operates treadles to lift pattern heddles while manually manipulating bamboo sticks to form the shed. This loom uniquely uses bamboo sticks for symbolic coding; once arranged with a pattern "program," they mount directly onto the loom. Weaving alternates between pattern and plain heft insertion. The weaver cyclically exchanges bamboo sticks on the heddle rod to complete patterns. Since Dong patterns are symmetrical, only half the pattern is coded on the sticks—cycling them automatically weaves the full repeat, saving time and improving efficiency.

3.3.2 Dong Brocade Weaving Process

Taking the "Eight Petal Flower" pattern in Figure 3 as an example, a two-shuttle weave method with alternating black and white wefts is used. Four picks form one pattern bamboo stick cycle. Weaving requires 15 pattern bamboo sticks. One shuttle holds two white yarns, and another shuttle holds two black yarns. Each small grid in the diagram represents two warp threads.

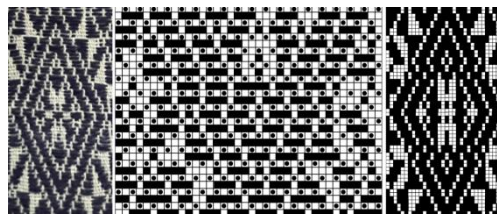


Figure 3: Eight Petal Flower pattern diagram, tissue diagram and pattern diagram

The weaver begins the first pick by pressing the jacquard treadle with the left foot, lifting the pattern heddle rod and V-shaped rocker arm while moving the first pattern bamboo stick from behind the rod toward the center to create a two-layer structure. The weaver passes the black-weft shuttle left to right through the shed and beats it tight manually, then removes the bamboo stick behind the heddle loop and releases the treadle. For the second pick, the weaver presses the plain weave treadle with the right foot, raising the bottom warps, presses down the reed to form the shed, passes the white-weft shuttle through, and beats it tight before releasing the treadle. The third pick uses the lease rod shed without pressing any treadle; the weaver passes the shuttle and beats it tight with the reed. The fourth pick repeats the second, alternating pattern and plain wefts so four picks complete one bamboo stick cycle, and cycling through all 15 bamboo sticks finishes the pattern.

4. Ornamental Handicraft Techniques of Dong Embroidery and Brocade

Dong embroiderers express their yearning for life through the handicrafts of embroidery and brocade, serving the function of conveying meaning through "patterns" in the past when the Dong ethnic group lacked a written script. These art forms represent the Dong people's good wishes for life.

4.1 Convergence in Ornamental Connotation

Pattern themes are divided into animal motifs, plant motifs, geometric motifs, and human/deity

motifs. Dong women skillfully combine these patterns with textiles, using Dong brocade and embroidery as carriers for pattern expression, forming a pattern language.

4.1.1 Animal Motifs

Animal patterns are the most common type. Animal pattern motifs include fish, spider, butterfly, horse, magpie, wild goose, sheep, fish bone, mantis leg, warhorse, etc., totaling 10 types. Dong women weave numerous animal patterns on brocade for two main reasons: firstly, in primitive societies, extensive hunting led to worshipping animals to seek psychological comfort, gradually deifying them and considering animals as mysterious incarnations of nature. Secondly, the Dong people revere the strong vitality of animals and their abilities surpassing humans. For example, the spider pattern represents proliferation and the meaning of life.

4.1.2 Plant Motifs

Common plant motifs in Dong areas mainly include maple leaf, duckweed, moss, bamboo root flower, etc. The Dong region is renowned for its abundant timber reserves. Particularly, the thousand-year-old banyan trees in Sanjiang, because banyan is homophonic with dragon in Chinese, are symbolized by the Dong people as the tree of life, embodying their wish for the prosperity of their ethnic group, hoping it thrives like the banyan tree.

4.1.3 Human and Deity Motifs

The Duo Ye pattern (depicting a circle dance) is the main human pattern, while totem worship, dragon and phoenix patterns, and classical mythological stories represent deity motifs. Patterns of people holding hands often appear in Dong brocade as a form of human pattern, representing the Dong collective sacrificial dance. Snakes possess strong vitality, aligning with the survival and reproduction desires of primitive ancestors. Simultaneously, snakes pose a significant threat to humans, inspiring awe and thus becoming worshipped[4]. In the daily life of the Dong people, these patterns are regarded as auspicious symbols, bringing happiness and fulfillment to their lives.

4.1.4 Geometric Motifs

Geometric patterns are a major traditional Chinese decorative theme. Common geometric patterns in Dong weaving and embroidery include: swastika, fret pattern, diamond, square, hexagon, triangle, etc. These were already skillfully applied on painted pottery vessels five thousand years ago, demonstrating the wisdom and creativity of our ancestors[5]. Dong ancestors highly abstracted and summarized geometric patterns, often expressing highly abstract, generalized patterns in figurative forms, creating perfectly abstract patterns with formal beauty connotations.

4.2 Differences in Ornamental Form

In the Dong brocade weaving process, patterns are formed through picking and threading, creating a cross structure where warp and weft intersect. Brocade patterns are more vivid and symbolic. Dong embroidery is completed stitch by stitch, resulting in softer pattern edges, and the embroidery exhibits characteristics of randomness and freedom. When weaving larger items, four-way or six-way continuous composition is usually adopted, allowing patterns to be joined seamlessly. When weaving smaller items, two-way continuous composition is usually used, resulting in more delicate and refined patterns. Whether four-way or two-way continuous, the pattern layout exhibits symmetry. Dong embroidery presents characteristics of free composition. Embroiderers depict things they see in life. The edges of embroidery patterns are usually curved,

relatively soft, and the patterns emphasize figurative features.

5. Coexistence and Comparison of Primitive Looms and Machine Embroidery

We posit a comparison between the coexistence of primitive looms and machine embroidery. Although, in terms of the loom itself, machine embroidery is faster and more efficient. The process of machine embroidery mainly includes the following steps: First, a designer creates the pattern, which is then input into a computer for detailed processing. A pattern maker sets the embroidery colors and thread density, finalizing the design. Finally, the embroidery machine carries out mass production.

5.1 Comparison in Process Efficiency and Sales

With the sharp increase in market demand for brocade, hand-woven brocade involves long production times, low productivity, and high prices, leading to supply shortages in the hand-woven brocade market. Hence, computer embroidery emerged.

5.1.1 Comparison in Process Efficiency

The primitive loom uses a bamboo coding principle to pre-set the warp thread movements, separating and interweaving the threads. While manual shuttle throwing and foot-operated beating-up offer some efficiency gains, the process remains slow. Even skilled weavers can produce only about one chi (approx. 1/3 meter) of Dong brocade per day. The loom's limitations in production time, cost, and fabric width result in low process efficiency. Machine embroidery, in contrast, is highly procedural. After an image is imported, parameters and corrections are set on a computer, and the data is sent directly to the machine. Machine embroidery is exceptionally efficient, capable of producing about 1 meter of Dong brocade per hour. It features high efficiency, simple operation, and large capacity. Although the primitive loom may offer greater variety and finer craftsmanship, machine embroidery still achieves exquisite results and is continually advancing. While both methods share the same form of craft expression, machine embroidery is significantly more convenient and faster than the primitive loom in terms of process efficiency.

5.1.2 Comparison in Sales

Handmade brocade has very even and clean edges, whereas the edges and tips of machine-embroidered patterns are often blurry, messy, and uneven. Handmade brocade has many transitional intermediate color layers, resulting in delicate and vivid images. Machine embroidery has limitations in color choice, with harsh transitions between color blocks. Handmade brocade has a wide variety of categories and diverse themes. Machine embroidery patterns are generally simpler. The thread used in machine embroidery is made from chemical fiber materials, shinier and requiring high tension during machine operation, giving the product a stiff feel. The machine embroidery process must ensure no thread breaks, so the back of the product is filled with continuous lines. For the same pattern, the machine-made product feels stiffer. Handmade brocade is softer, has the same pattern on both sides, and has no excess thread ends. Handmade brocade requires the exquisite skills of the weaver, involves long production times, and is expensive. It is generally used for high-end customization in modern fashion design. Machine-made brocade is efficient, allows for industrial mass production, and is therefore cheaper, commercialized, and more widely used.

5.2 Comparison in Cultural Identity

Traditional handicrafts embody the wisdom of folk creation and are important carriers for inheriting the traditions and spirits of different ethnic groups. In traditional attire, hand embroidery and brocade are recognized by their own ethnic group. The higher price of handmade brocade is due to its low efficiency, time-consuming nature, and high recognition rate. The original form of Dong brocade, serving as practical items for ancestors to keep warm and ward off cold, gradually evolved into a unique ethnic brocade art. This represents the Dong people's active pursuit from merely needing functional attributes to possessing both function and aesthetics.

6. Conclusion

Amid the wave of industrialization, ethnic culture and traditional culture still demonstrate their indomitable strength. In the context of cultural heritage, patterns hold a pivotal position. Given the historical fact that the Dong ethnic group lacked its own written script, its people have meticulously recorded their life aspirations and hopes through Dong brocade and embroidery. These art forms carry the profound spiritual sentiments of the Dong people. In the practice of technique inheritance, people acknowledge the form and price of machine weaving, yet cannot relinquish their deep emotional attachment to traditional weaving crafts. This reflects the contradictions and conflicts between traditional craftsmanship and modern development against the backdrop of changing times. It is commendable that in the formation of the unique cultural phenomenon of the Dong "world of patterns", folk wisdom played a crucial role, particularly the use of symbolic coding, which highlights the extraordinary wisdom and creativity of ancient people.

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