

Design Resource

Guitar Making - Dum Dum, Kolkata

Musical Instrument Making

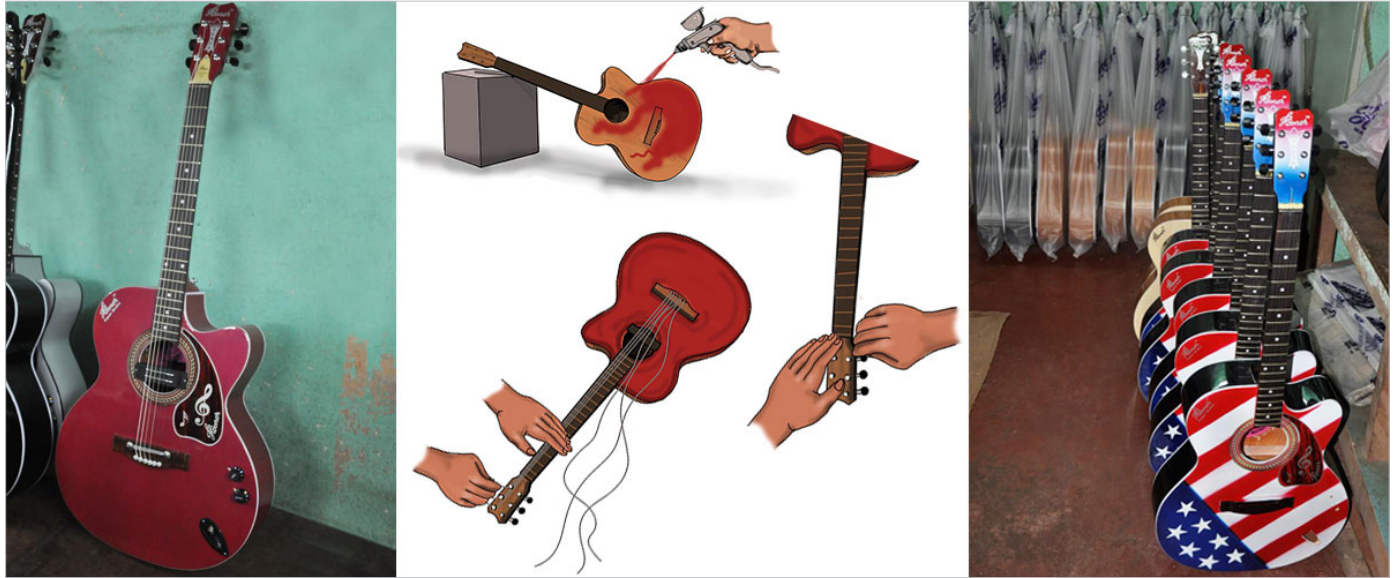
by

Prof. Bibhudutta Baral and Srikanth B

NID, Bengaluru

Source:

<https://dsource.in/resource/guitar-making-dum-dum-kolkata>



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2. Tools and Raw Materials
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Introduction

The guitar is a fretted string instrument that possesses a string number between four and eighteen, usually six. Anciently, a guitar was identified as an instrument with several chordophones assembled to form a long fretted neck, flat wooden soundboard, ribs, a flat back, and incurved sides. This type is believed to be developed and used across Europe in the 12th century. Later an improvised version slowly spread to America. Here the sound was produced acoustically using a hollow wood. These events occurred before the electric guitar and the use of synthetic materials in the making came into existence.

Tracing back to its history, a 3300-year-old stone carving depicting a Hittite bard playing a stringed instrument is the oldest iconographic representation of chordophone and clay plaques found at Babylonia. This underlines a possible Babylonian origin to the guitar. According to legends, the German Gitarre, and the French guitars were all adopted from the Spanish Guitarra, which is derived from Ancient Greek kithara, Andalusian Arabic qitara, or the Latin cithara. Though there are no close impressions of modern-day guitar from a period before the Renaissance, there were many string instruments that related to guitars either in physical form or playing technique. One of the earliest of these is Lute, a long-necked instrument with a waisted soundbox. This survived the competition from the third to the sixth century. During the Renaissance, the guitar's closest contemporary was the Vihuela, a form larger than guitar, with six or seven courses of strings and tuned like a lute. The first instruments that modern audiences would recognize as guitars were built in the fifteenth century. The main parts of a guitar are the body, the fretboard, the headstock, and the strings. While the body is made of wood, the strings are created out of steel or nylon. Though the strings are generally plucked with fingers or fingernails, a small pick made of thin plastic called "plectrum" also comes with the same function. Guitars can be divided into two broad categories, acoustic and electric guitars, which are further divided into several subcategories as per their technical construction and playing style. Hovner Musical Industries is a musical instrument manufacturing and trading unit based in Kolkata that makes guitars. Around 15 types of guitars are manufactured in this unit.

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Guitar Artisan Mr. Sulojit.



Artisan involved in shaping the wood.



Display of guitar instruments.

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Tools and Raw Materials

The tools and raw materials that are used for guitar making are as follows:

- **Frame:** It is used to make the middle portion of the guitar body.
- **Plywood:** It is used to make the main body of the guitar.
- **Adhesive:** It is used as a binding agent to stick guitar parts.
- **Nail:** It is hammered to the plywood parts for stronghold.
- **Decolam Sheet:** It is trimmed into the intended size to be stuck at the edges of the guitar body.
- **Bronze Strings:** It is fixed at the neck area known as the truss rod.
- **Varnish:** It is used to give glossiness to the guitar after smoothing.
- **Sandpaper:** It is used to smooth the neck and body parts of the guitar.
- **Hand Drill:** It is used to drill holes at the neck portion with hands.
- **Hammer:** It is used to hammer nails to the guitar.
- **Handsaw:** It is used to cut wood plank into required shapes.
- **Hacksaw Blade:** It is used to trim extra surfaces on the frets.
- **Coping Saw:** It is used to trim extra pieces of wood placed at the middle portion of a guitar body.
- **Cutting Plier:** It is used to trim brass strips and bronze strings.
- **Nylon Strings:** It is used to fix the bridge that runs through the fretboard and join the tuning pegs for a combination of sound.
- **Dust Collection:** It is used to fill up small gaps in the guitar.

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- **Tuning Pegs:** It is used to adjust the strings to a balanced pattern at the end of the frets.
- **A Band Saw:** It is used to shape the body of the guitar.
- **Steel Scale:** It is used to measure the size of the parts used for the guitar.
- **Pencil:** It is used to mark the size as per the measurement.
- **Mini Scraper:** It is used to carve a shape at the guitar's neck.
- **Wax Sticks:** It is used to cover the nail holes on the guitar.



Plywood, used for making body parts of the guitar.



Scraper is used for smoothing and for shaping the wood.



Chisels and hammer are used for the carving process.

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A drilling machine is used for making insertions in the guitar body.



The mold is used to create the base body for the guitar.

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Making Process

Firstly, the artisan decides on the kind of wood used for guitar making. Here popular options among the craftsmen are usually maple wood and rosewood for their supreme quality. Once the wood is finalized, it is cut from lumber using book matching, a method in which a single piece of wood is sliced into two sheets, both of the same length and width. This step gives the sheets a symmetrical grain pattern. These sheets are then matched to ensure grain continuity and glued together. Once dry, the newly joined boards are ground with sandpaper to the right shape and thickness. The next step comes to cutting the top board to guitar shape. Though it seems to be an oversized shape during the process, it takes the right form after trimming.

A sound-hole with slots is carved around this newly formed shape to incorporate concentric circles that act as decorative inlays around them. Next, wood braces are glued to the top piece's underside for two functions, one to brace the wood against the pull of strings and the second to control the maximum vibrations, both to achieve the right musical tone. The process of brace fixing is popularly called Shrutting, a method that differs from company to company. Commonly, braces today are glued in an X-pattern, but here at the Hovner Company, the artisans follow a unique style: their trade secret. This confidential design adds immensely to the guitar's sound quality. Here strips of wood are set parallel from left to right till the glued joint at the long end of the guitar. Similar to the top portion, the back is also cut and glued, followed by a book-match technique. Then finishing the sides by cutting and sanding strips of wood, the structure is soaked in water for softening of wood. Once removed from the water, these strips are placed into molds for achieving the curve shapes required for the instrument. The entire assembly is then clamped for a while to ensure symmetry between the two sides. It is then glued to the inside walls with basswood-based adhesive. End blocks are also used to join the top, back, and neck areas of the guitar. Once both sides and end blocks are ready, they are attached to the top and the back area of the body structure. Here excess wood is trimmed off, and slots are cut along the side-top and side-back junctions for body bindings. The bindings are not only decorative but prevent moisture from entering through the sides, thus warping the guitar. The neck is made up of hard rosewood carved to exact specifications. This neck is inserted with a reinforcing rod and sanded before the fingerboard is fixed over them. Using precise measurements, frets of steel wires are put in place to make fretboard. Once the neck construction is finished, it is attached to the main body by fitting a heel that extends to the pre-cut groove on the wood body. Once the heel dries up, the entire guitar is coated with a layer of sealer, followed by several coats of lacquer. In some cases, intricate decorations or inlays are also worked on the guitar top. Then a bridge is attached near the bottom of the guitar below the sound-hole, and a saddle is fitted. It is made sure that the nuts placed between the head and neck of the guitar are tightened. The nut is a strip of wood or plastic on which the strings lie as they pass to the head and into the tuning machine. The tuning machine is the most delicate part of the guitar and is usually mounted on the back of the head. The pegs that hold each string are housed in metal casings. Finally, the guitar is inspected for quality assurance before packing up from the work area. The entire process of guitar making takes around seven days, which largely depends on the artisan's intent to decorate the guitar top or leave it simple.

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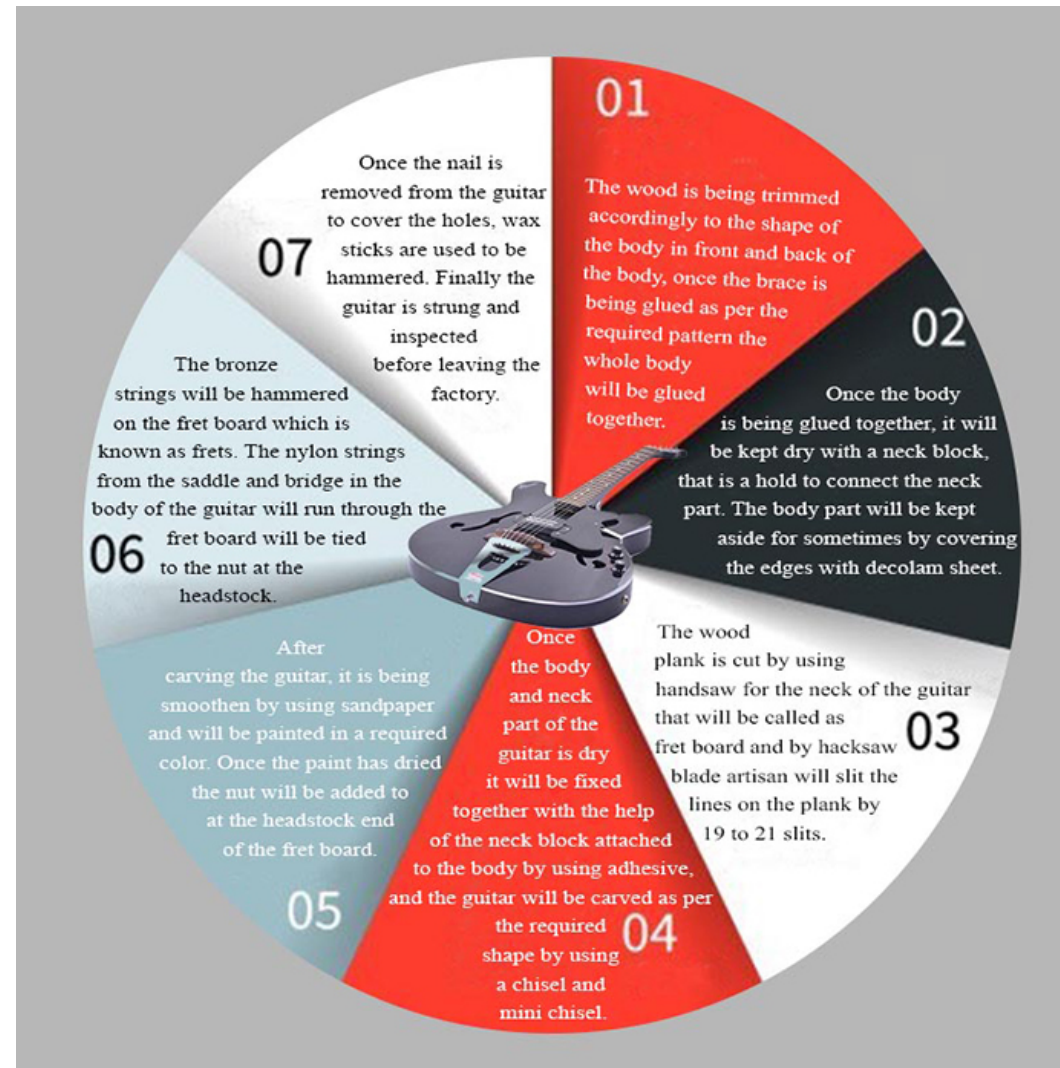
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Flow Chart:



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Artisan cutting the base body for the guitar.



Plywood being fixed into the mold.



Artisan removing the mold frame.

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Supporting sticks being placed inside the body.



Cutting the neck area according to measurements.



The Decolam sheet is cut into lengthier strips as per requirement.

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Decolam sheet strips are attached to the border.



The semi-finished look of the guitar body.

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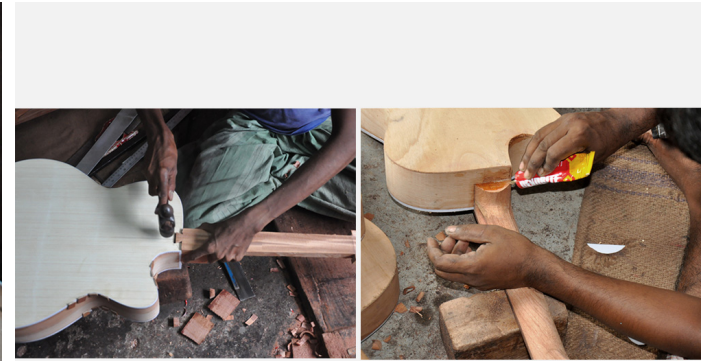
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A hole or insertion is made on the bridge part.



With the help of adhesive and hammer, the body and neck of the guitar are attached.



The fretboard is attached over the guitar neck and frets arranged according to the measurement.

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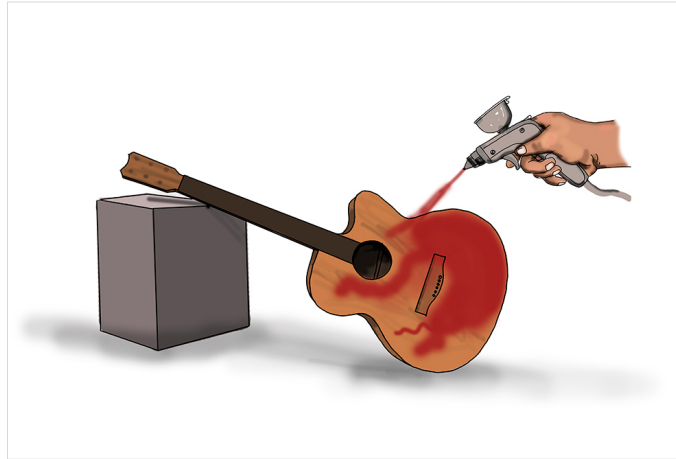
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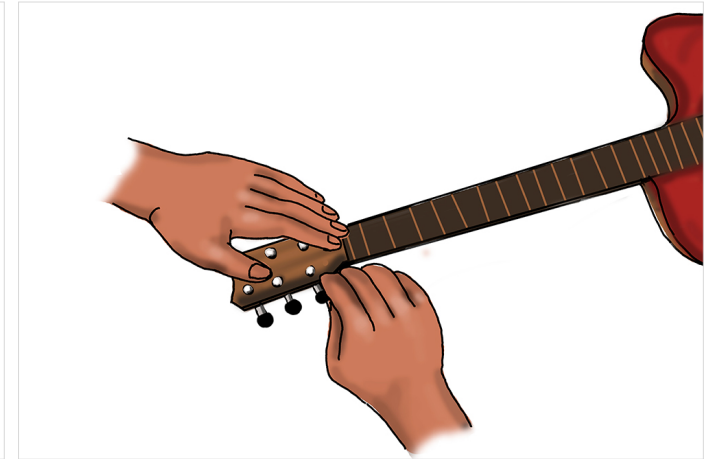
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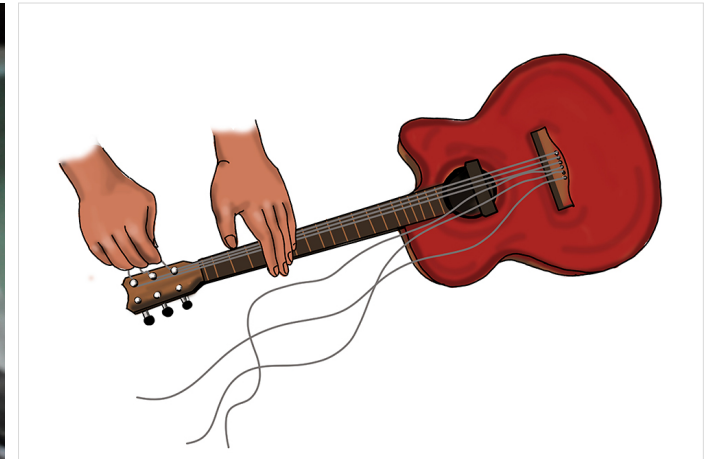
Paint is applied to the body using a spray gun.



Tuning pegs fixed on the headstock of the guitar.



Holes made as a reference mark on the neck.



One end of the string is knotted on the bridge part and another to the tuning pegs.

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Products

Hovner Musical Industries is a musical instrument manufacturing and trading unit based in Kolkata run by craftsman Mr. Surajith Mandal. The firm that has been in the business for 60 years, passing over two generations, today employs eight senior artisans who are well versed in the craft. About 15 types of guitars are produced at the center under four categories: Acoustics, Hawaiian, Spanish, and Mandolin, all exclusively handmade. The price range of the guitars starts from INR 2,000 and goes up to INR 3,500, where the size ranges between 30 inches and 39 inches. Here the frets are arranged as per the quality scale decided for the product; hence at Hovner, it weavers around 19 to 21 in numbers for achieving good sound quality.



Guitar, a musical instrument of Kolkata.

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Video



Guitar Making - Part 1



Guitar Making - Part 2

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Contact Details

This documentation was done by Professor Bibhudutta Baral and Srikanth B at **NID, Bengaluru**.

You can get in touch with him at [bibhudutta\[at\]nid.edu](mailto:bibhudutta[at]nid.edu)

You can write to the following address regarding suggestions and clarifications:

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