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Abstract

By request of Dr. Gregory Beyer, as well as the **Arcomusical** group, our team was tasked with improving the berimbau, or musical bow. The design that best fit this request was that of a **clamp mechanism** that included hook inserts to separate the strings. This design also allows for the gourd to move along the staff at any desired location. Given our final prototype, Dr. Beyer can now use this bow to **its full musical potential**.

Introduction

The berimbau is an African-Brazilian instrument strongly linked to the **dance fighting technique of Capoeira**. In its root this instrument was used to **muffle the sounds of slaves learning martial arts**. It is a one stringed musical bow with limited ability for a single instrumentalist. Our goal is to **expand the melodic potential of a single player by creating a stable multi-stringed berimbau instrument**.



Methods and Materials

The total design consists of a modified berimbau capable of functionally housing two strings, as well as a bridge clamp mechanism designed by our team to solve some of the basic functionality issues of the original berimbau and bridge the strings of the instrument.



Clamp Mechanism

- **Clamp:** This is a wooden clamp designed to wrap around the staff and allows the bridge, gourd and handhold to move along the staff.
- **Bridge:** The bridge is a wooden piece with a drilled-out hole for the hook inserts, and a set screw to keep the hooks in place.
- **Hooks:** Plastic coated metal hooks are inserted into the bridge to pull back the strings.
- **Gourd:** This is a standard berimbau gourd held to the clamp with a tension housing that tightens the clamp around the staff.
- **Handhold:** Built into the bridge is an ergonomic hold to ease the discomfort of holding the instrument.

Berimbau

- **Strings:** Second string for increased potential.
- **Staff:** Able to bridge the multiple strings at each end, as well as house multiple tuning mechanisms.

Results and Discussion

Due to the original limitations of the berimbau a second string drastically increases the functionality for a single player. The ability to **bridge the string in multiple locations** along with the use of an **additional string** means that much more complex compositions may be played by **fewer musicians**.

Conclusions

The addition and design of a clamps capable of holding two strings rather than one is increasing the melodic potential of the instrument by more than double. Also, the option of having two clamps applying tension at different areas on either string allows musicians to change playing styles fluidly in the middle of a composition.

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