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Violin Phone Mount: Vilophone

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Problem

For the violinist, playing on the go is a hassle because sheet music must be carried around along with a stand. Nowadays, sheet music can be viewed on a phone, and our product is designed to mount a phone in an easily viewable place on the violin.

Market

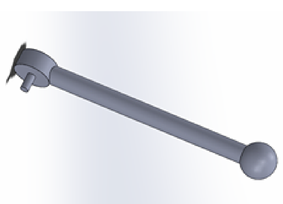
- Can aid violinists of all levels
- Particularly assists on-the-go performers such as street performers
- Orchestral / band practice can now exclude a cumbersome music stand

Differentiation

- Small stands exist for marching band instruments but none exist for string instruments, like violins.
- A unique solution to the problem of a continuously transition musician

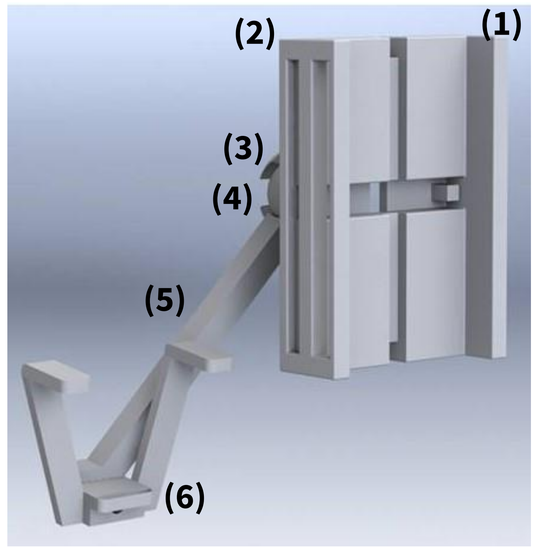
Scaling Up

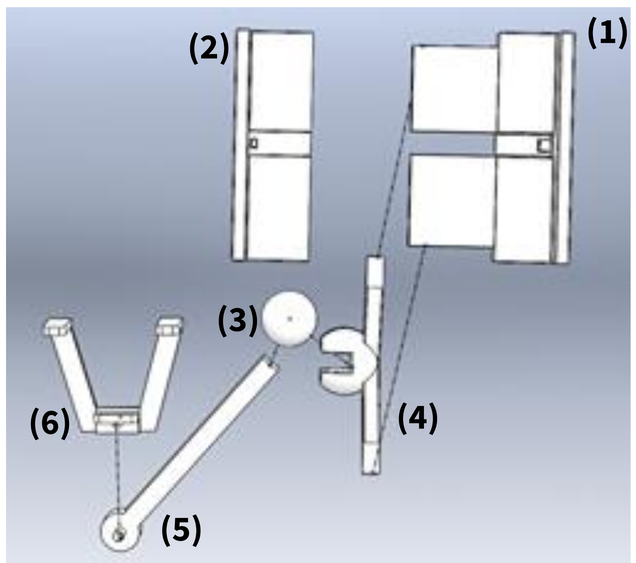
- Injection molding seems to be an optimal mass production method.
- Nylon appears to be better suited for the purpose of an instrument mount. PLA is light and stiff, but significantly more brittle and inelastic compared to nylon, making the latter a much better material for functional parts.
- Thicker foam pads without the resin plate will further prevent damage to the violin and allow for tighter clamping without adding unnecessary stress to the instrument's chassis material.
- A new arm design which not only allows for length adjustments but also a greater locking mechanism between it and the V-grip.

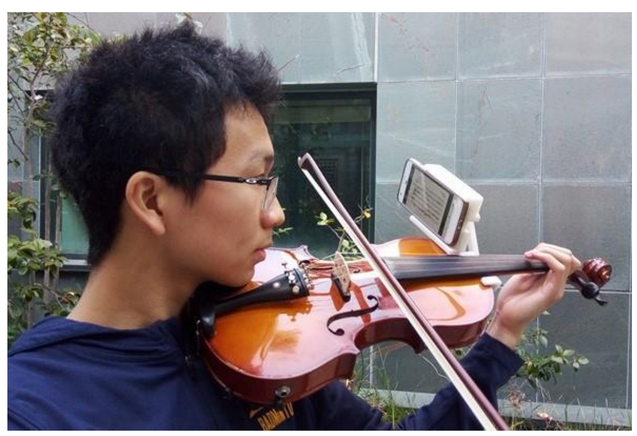


FITS AND TOLERANCES

- **RC9 [0.0045"-0.009"] allows phone cradle halves (1) (2) to slide easily to clamp phone.**
- **LN3 [0.0003"-0.0014"] ball and socket (3) (4) interference fit to allow for mobility of the stand while preventing a loose swivel.**
- **LN3 [0.0003"-0.0014"] interference fit between the rod of the arm (5) and the hole of the V-grip (6) prevents loose turning and redistributes the force from the phone on the violin**







Materials + Process

Type A 3D Printing with PLA

- Light yet stiff material.
- Lower chance of damaging violin and the phone in the case of an accident.
- 3D printing allows for unique shapes to be manufactured, such as the V-grip employed for the neck of the violin.

Manually Applied Adhesive Pads

- Allowed for specific pad shaped to be cut and applied to the V-grip, providing cushioning between the PLA and the instrument.
- This process can be automated during mass production, cutting time and monetary cost significantly

Separately Purchased and Manually Inserted Spring

- A regular and common part that can be bought.
- Insertion of the spring into the main body of the mount can also be automated during mass production, allowing for greater tolerances inside the product.

Possible Accompanying Software

With the Vilophone Phone Mount could be a phone app that scrolls through sheet music with time. This removes the need for the musician to scroll manually or use videos that scroll through the score and provides a complete experience for those using the product. The software may have more features such as being able to record the music and providing feedback about through note comparisons between the recordings and the expected pitches from the sheet music.

Reflection

- While 3D printing is very cost effective for rapid prototyping, many issues pertaining to tolerancing and fitting arose due to the low resolution of our Type A printing.
- Should have found a tightening mechanism for the V-grip-Arm attachment (perpendicular set screw, tightening O-Ring)
- The socket frame arms are slightly wider than anticipated, but this is not an egregious error. Phone cradle is very possibly too large and could be shortened, resulting in a decrease in material usage and the weight.
- To account for wear in the ball and socket join, we could have an O-ring to tighten the connection.

Engineering 27: Introduction to Manufacturing and Tolerancing, Spring 2018