

Assistive Holder for People with Disabilities

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Abstract

An assistive holder that could help people with disabilities to hold objects. Some people who use wheelchairs and cannot bend their back to hold objects they drop could use this device to help them to move the objects from the ground to any place that they want to put the object. This design helps people with disabilities to pick up and hold objects. By making the engineering requirements meet our customer needs, the users would not have difficulty using this device.

Problem Definition

The team created this device based on the customer needs. We have studied the customer that we have talked with and some of them cannot bend their back. One of them only can use one hand. So we have built the device to meet their needs.

Customer needs	Engineering Requirements
Lightweight	Less than 1.5 Kg
Length Change	Inner shaft change from 0cm up to 30cm
Safety	Shafts edges around 5mm
Easy to use	Only 3 parts to use

Table 1: Customer and Engineering Requirements

Fall-17 / Spring-18 Design

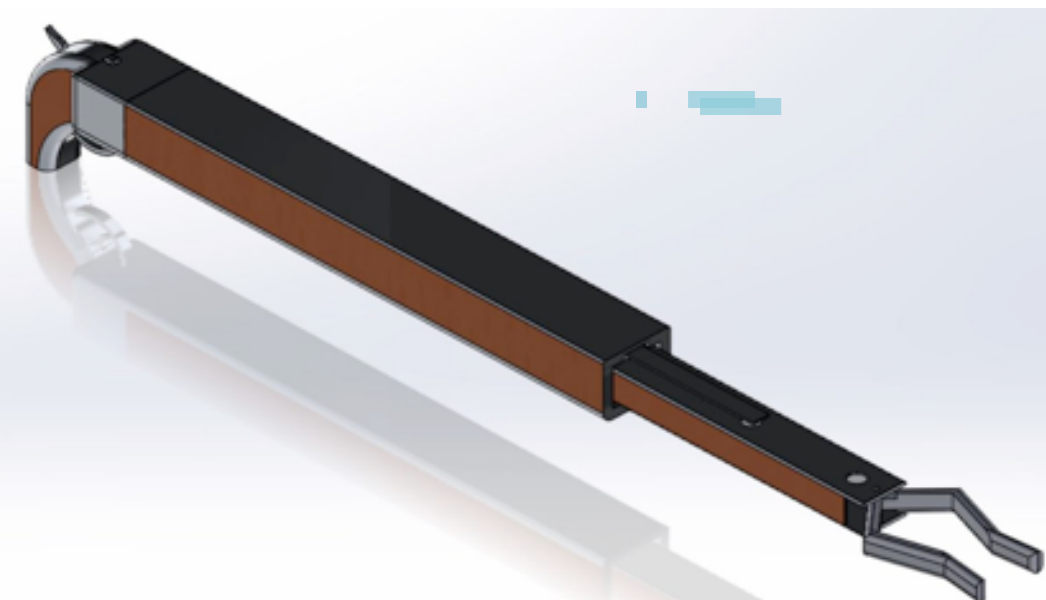


Figure 1: Fall-17 Design

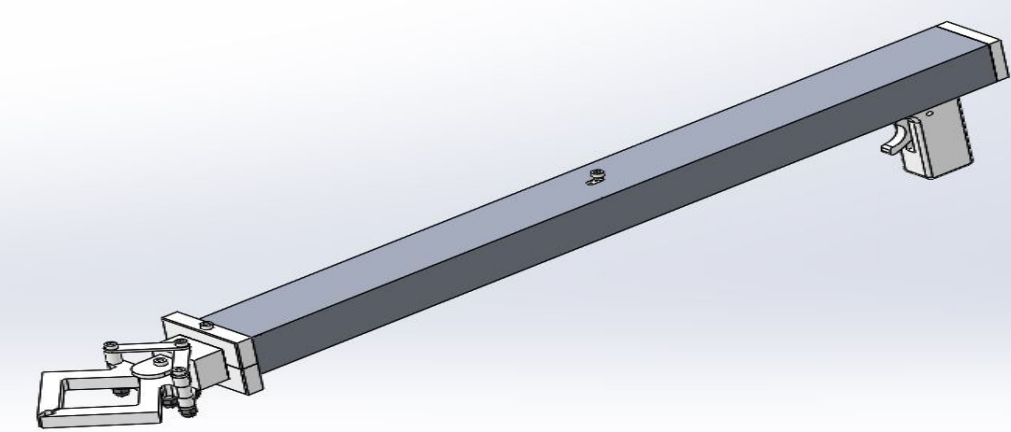


Figure 2: Spring-18 Design

The team made changes from fall-17 design and spring-18 design. Because the fall-17 did not meet the customer requirement.

Testing Methods

We have tested our devices to make sure it meets our engineering requirement, customer needs.

*Figure 3 and 5 are the way that is holding the brush and the device could hold the bottle of water the test succeed.

*In figure 5 that we measured the device by scaler and that showed us the device's weight it 1.180 kg.

*The device is 70 cm outer shaft and 30cm inner shaft length as you can see in figures 4 and 7.



Figure 3: Holds Brush



Figure 5: Holds bottle of water



Figure 6: weight

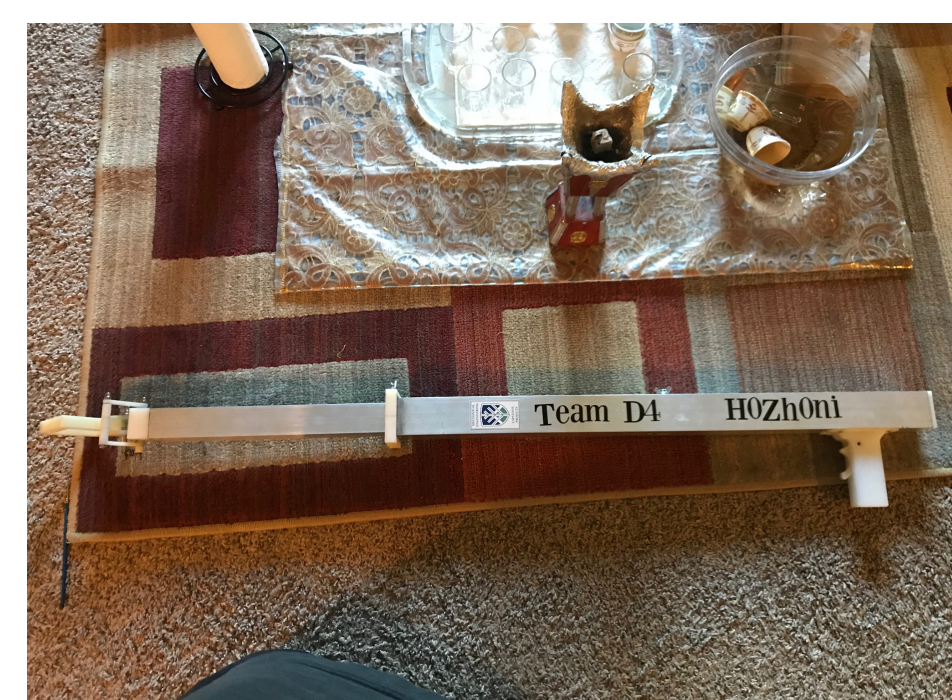


Figure 4: inner shaft



Figure 7: outer shaft

Final Design

As it shown in figures 8 and 9 that is the spring-18 CAD and manufactured. So we made our device from Aluminum (shafts) and the handle, trigger, grabber teeth, links are made from Arton

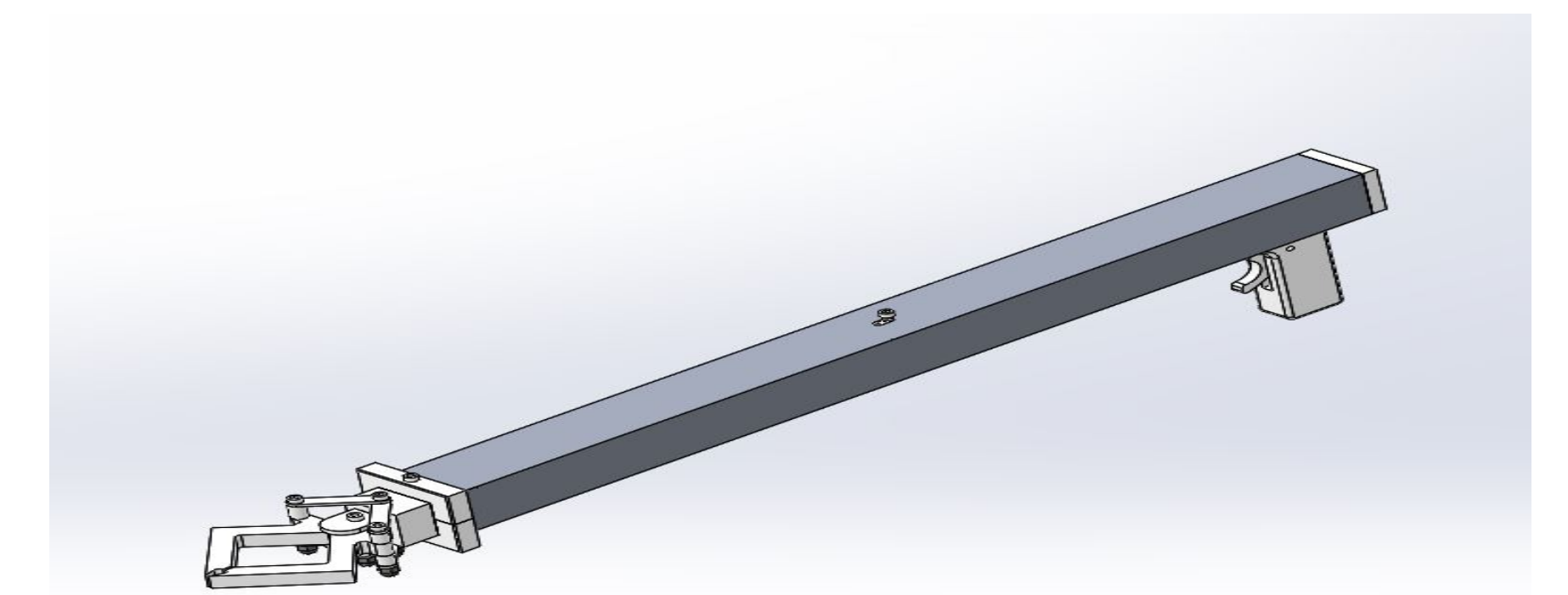


Figure 8: Spring-18 CAD Design



Figure 9: Spring-18 Manufactured Device

Client/Sponsors

*Client:
Hozhoni Foundation Art Studio
*Sponsor:
W.L GORE



References

- [1] "Top 10 Reacher Grabbers of 2017 | Video Review", Wiki.ezvid.com, 2017. [Online]. Available: <https://wiki.ezvid.com/best-reacher-grabbers>. [Accessed: 05- Nov- 2017].
- [2] "PIK-STIK Products at The Betty Mills Company", Bettymills.com, 2017. [Online]. Available: https://www.bettymills.com/featured/pikstik.html?gclid=EALaIQobChMIq-iDyIm11wIV27rACH2WEAeTEAAYAAEgJw5vD_BwE. [Accessed: 05- Nov- 2017].

Customer Interviews

As it shown in table 2. An interview was conducted in this research process. The same questions were asked to all the clients about the most vital thing that they are looking for in this design.

Customer	Customer 1	Customer 2	Customer 3
1	Lightweight	Easy to set up	Length change
2	Angle change	Easy to use	Lightweight
3	Length change	Lightweight	Safety
4	Easy to set up	Safety	Angle change

Table 2: Interviewing Customers