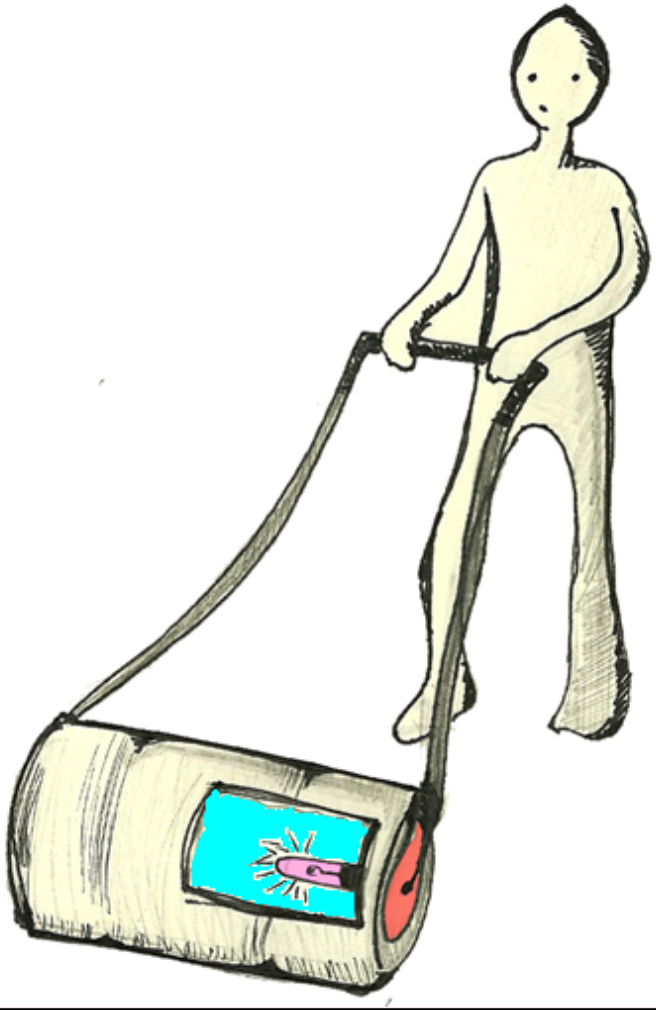
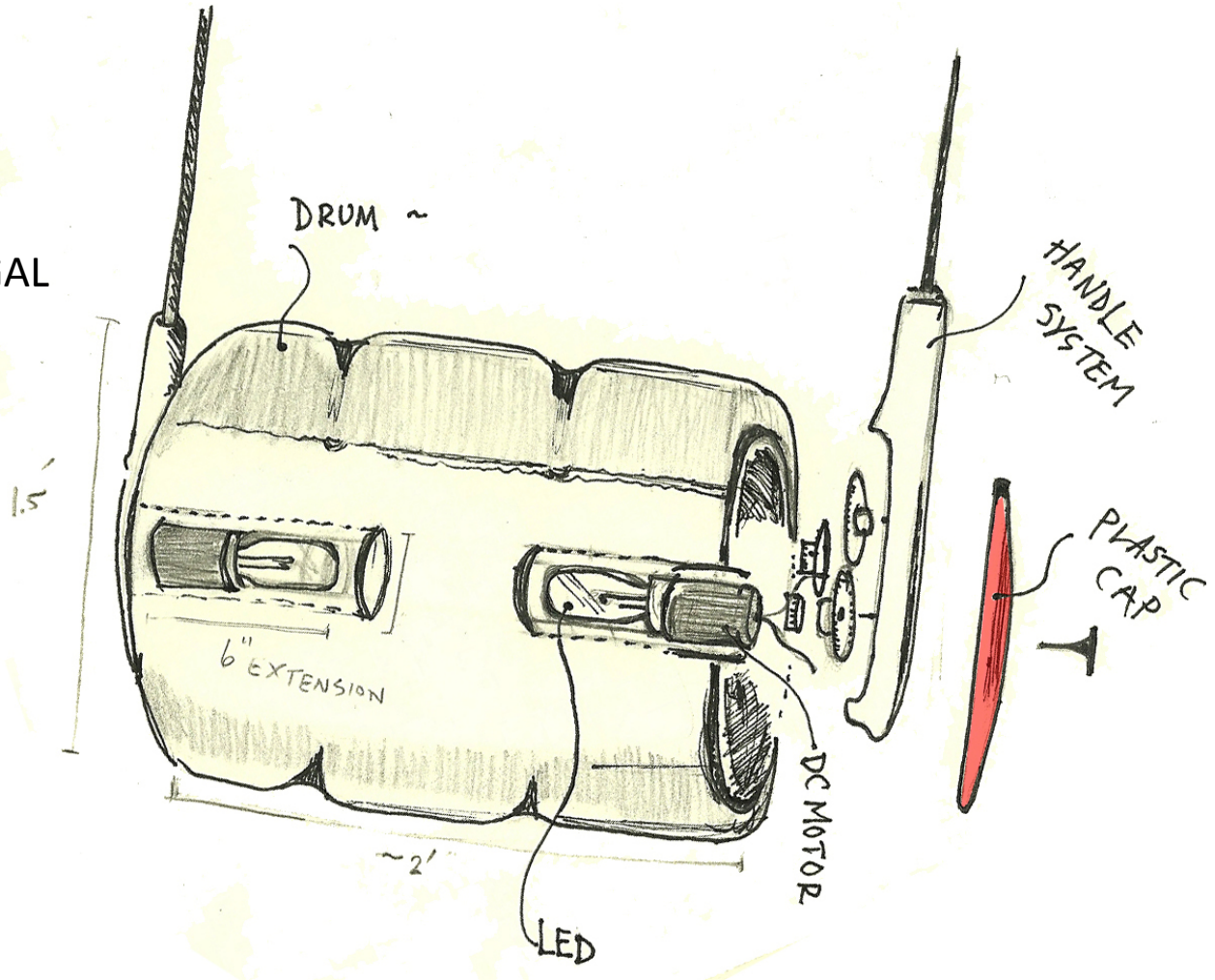
Lightning Jug



UV Light +DC Motor = H2O

~25 GAL

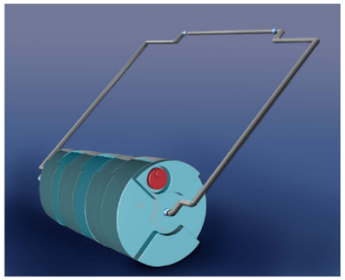


Benchmark

Purification

SteriPen
($100)

Bucket
($5)



Aquaport ($45)

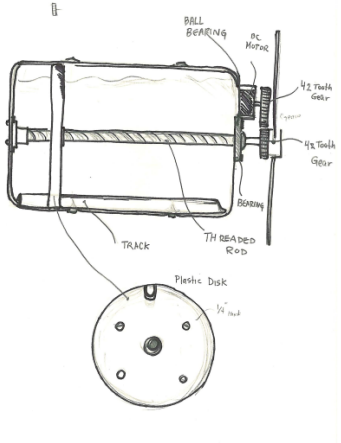
Hippo Roller
($75)

Transport

Benchmark

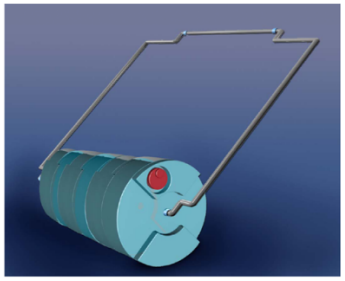
Purification

SteriPen
($100)



Lightning Jug
(less than $75)

Bucket
($5)



Aquaport ($45)

Hippo Roller
($75)

Transport

Product Contract

Customer Need	Product Attribute	Engineering Specification
Potable water	Purification system	Deactivate more than 99.9% of illness causing microbes
Can be pushed easily	Usability	Less than 20% of total mechanical power required to push roller.
Can be used without external power source	Self-powered	Human powered generator less than 100W
Can be maintained easily	Longevity of parts and assembly	Life of parts greater than three years
Reasonable price	Cost	Cost less than $75 (unsubsidized)

Risk 1: Microbes

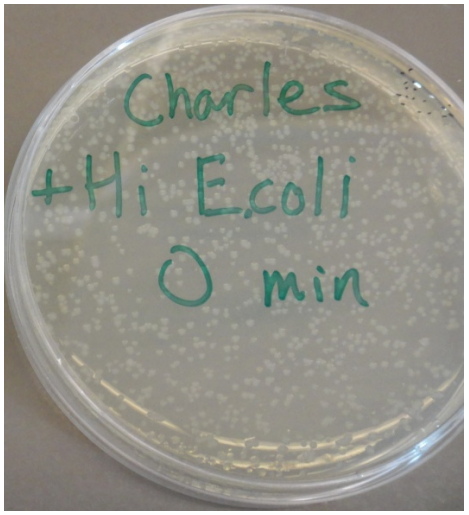
Problem: How to ensure all the harmful bacteria is deactivated during transport?

•Simulated experiment with aquarium 9 Watt UV pump and e-coli.

•80% reduction in bacteria for single pass in 17 seconds

•99% reduction in bacteria for multiple passes in 5 minutes

Solution: Allow for multiple passes across the UV light.



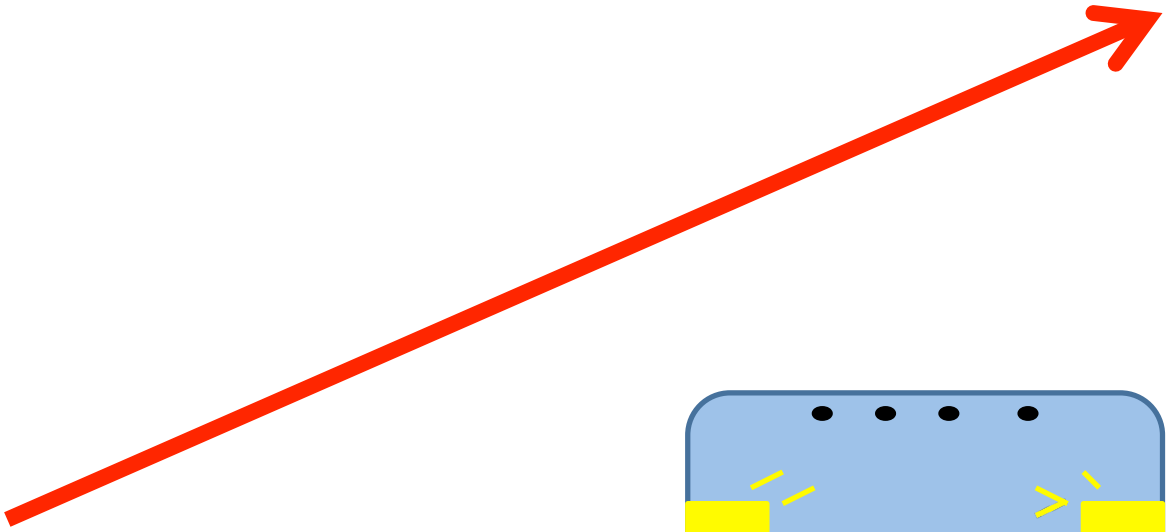
Risk 2: Power

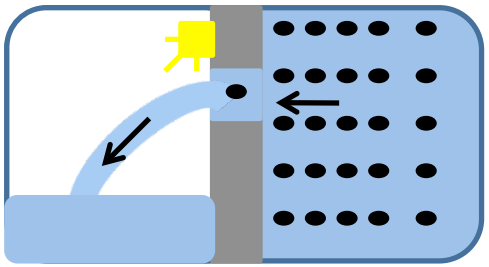
Problem: How to generate enough human power to push the drum and activate the UV lights simultaneously?

- Bring total operation energy to 70 Watts, less than the average human output of 100 Watts.
- Reduce energy and size required for UV bulb .

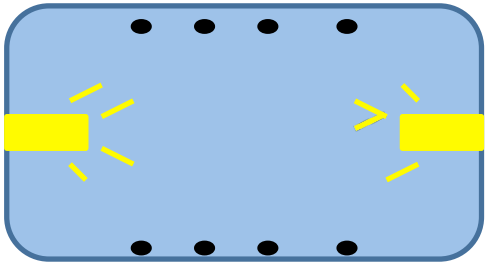
Solution: Control the water flow to minimize the volume of water exposed to a certain flux of UV energy via a channel or pump.

Progress

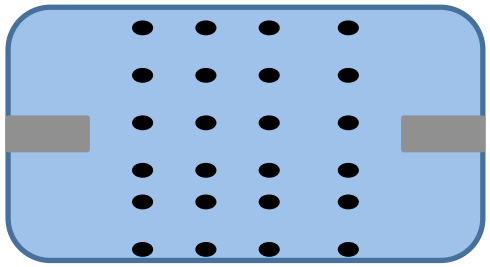




Current Concept with flow control.



Concept at time of Sketch Model without flow control.



Jug without any UV light

Future Development

- Make electrical system water proof.
- Better avoid contaminating water that has just been purified in the flow.
- Integrate the new developments with our contact's existing product, Aquaport.