

Bike-Powered Pump

Wilson Moyer

Challenge, Action, Results



Challenge

There is a lack of water access in Sierra Leone. The water is often contaminated by mines, and thus people often struggle to get the water needed for irrigation.

I was tasked with engineering a bike-powered pump to bring water those struggling in Sierra Leone. The tasked requirements were that it needed to be sturdy, have a decent flow rate, and be operable by pedal-power.

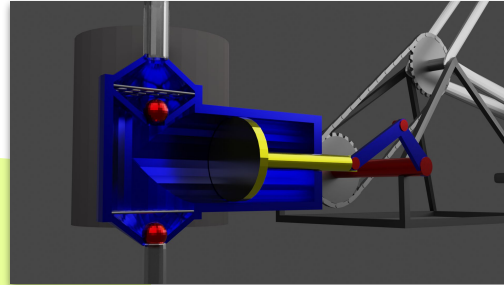


Pictures from Sierra Leone (Source: Heather Cumming (SSAAP Executive Director and Founder))

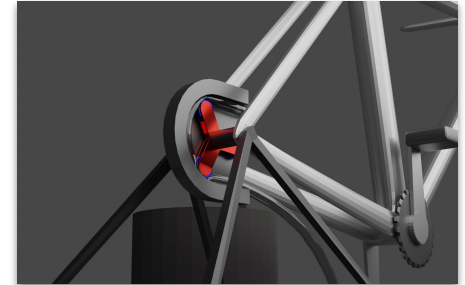
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Action

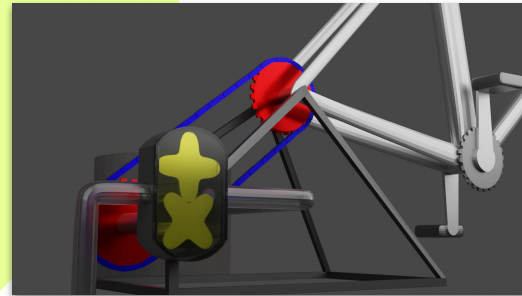
1. Project proposal with 3D concept prototypes
2. Initial chosen solution was to use a peristaltic pump
 - a. After further testing, we deemed the peristaltic pump design to have too low of a flow rate
3. Further iterations involved testing and using a drill-operated pump



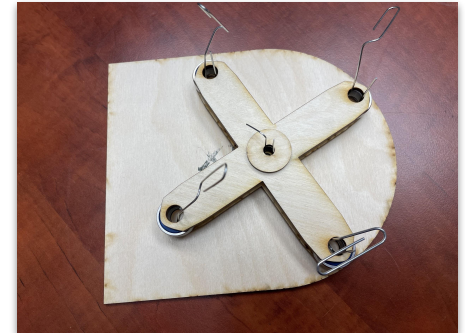
Piston Pump 3D Demonstration



Peristaltic Pump 3D Demonstration



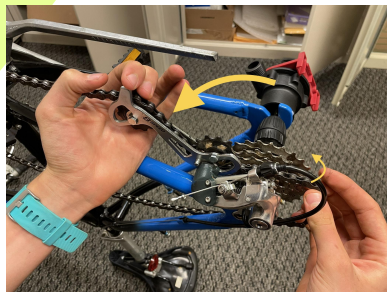
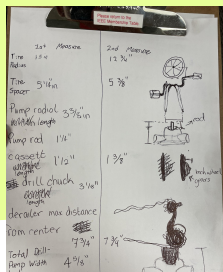
Lobe Rotary Pump 3D Demonstration



Peristaltic Pump Prototype

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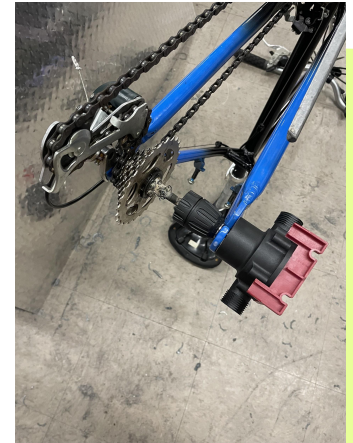
Action



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Results

The bike pump is now operational, and only needs a stand (which a different department will build) before it can be sent out. It pumps water without difficulty, is easy to maintenance, and is sturdily built. After the stand is complete it will be shipped off to Sierra Leone where it will pump water into a water treatment device or pump water for irrigation.



Other Notes

It has always been my dream to use engineering to make the world a better place. It deeply excites me that this project will soon be sent to Sierra Leone to serve people there, and I am extremely grateful for the opportunity to make a difference with this project.

Acknowledgements:

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