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07 PAPER CRANES THE PAPER CRANE

CEO: Saaya Daga

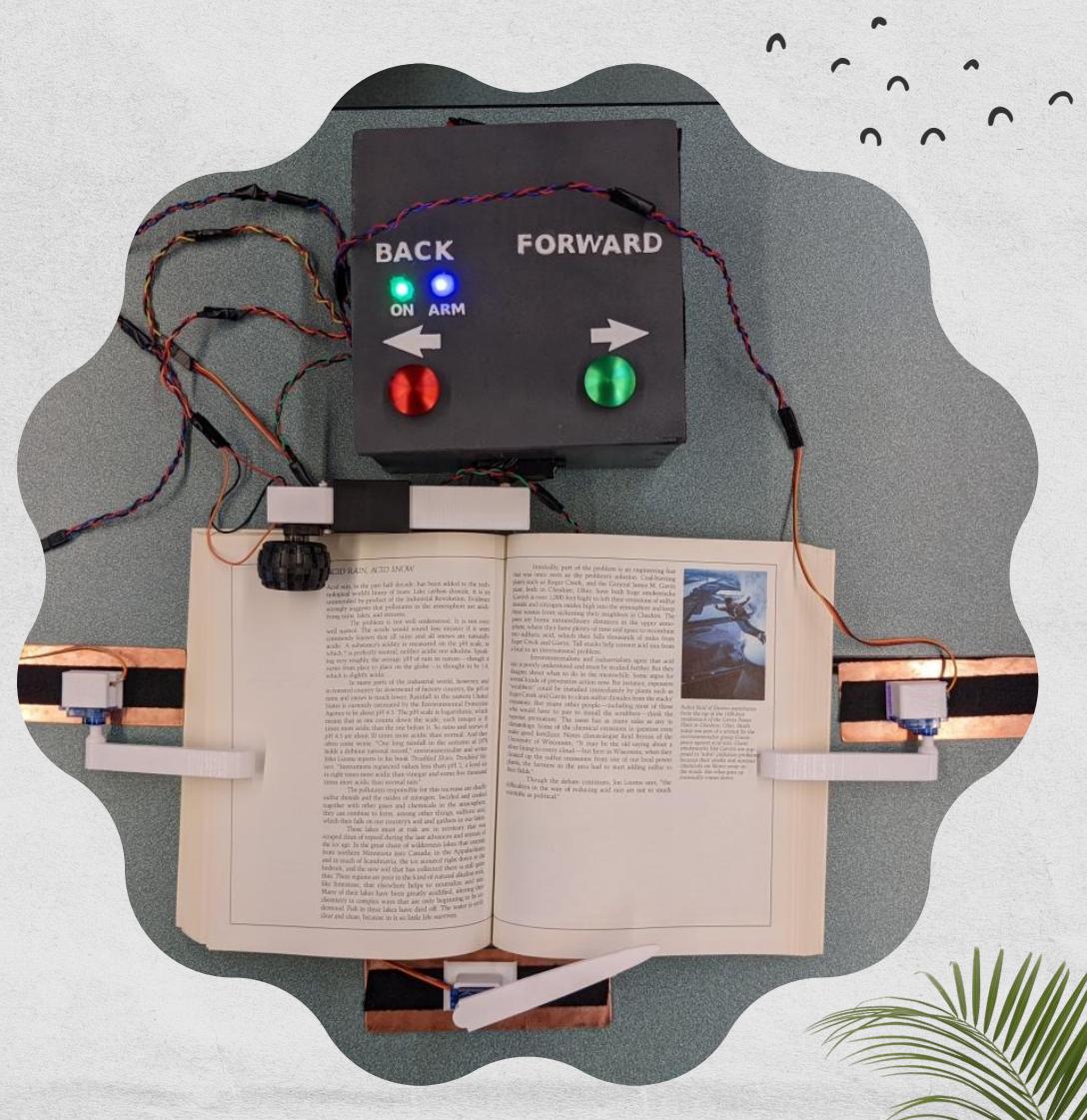
CTO: Ryan Mechery

CMO: Daniel Kaminski

CIO: Maya Zheng

May 24, 2022

Acceptance and Delivery Review

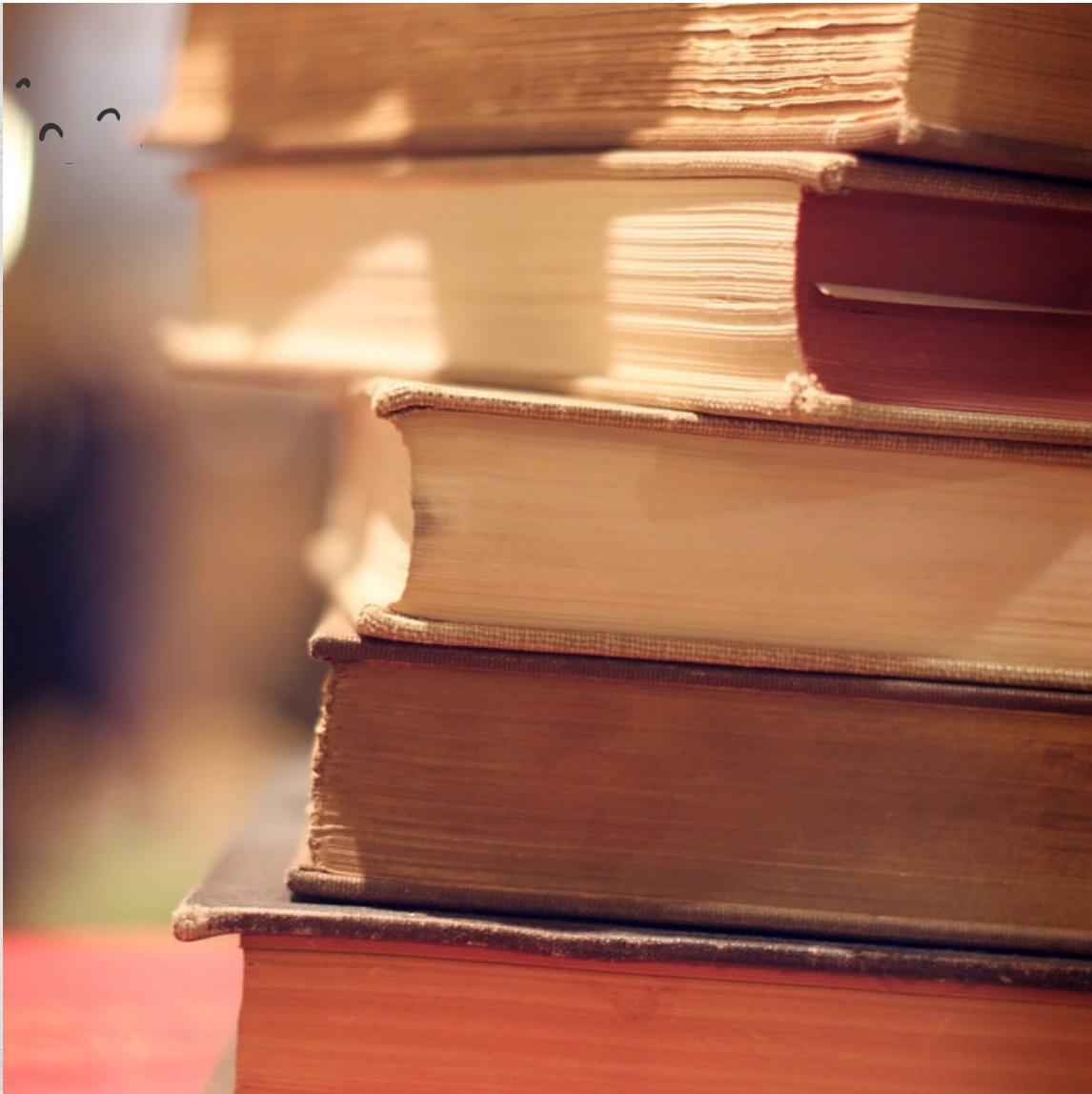


PROBLEM

People with motor disabilities have difficulty turning book pages independently

Target audience: Individuals with physical disabilities, especially in the arms and hands

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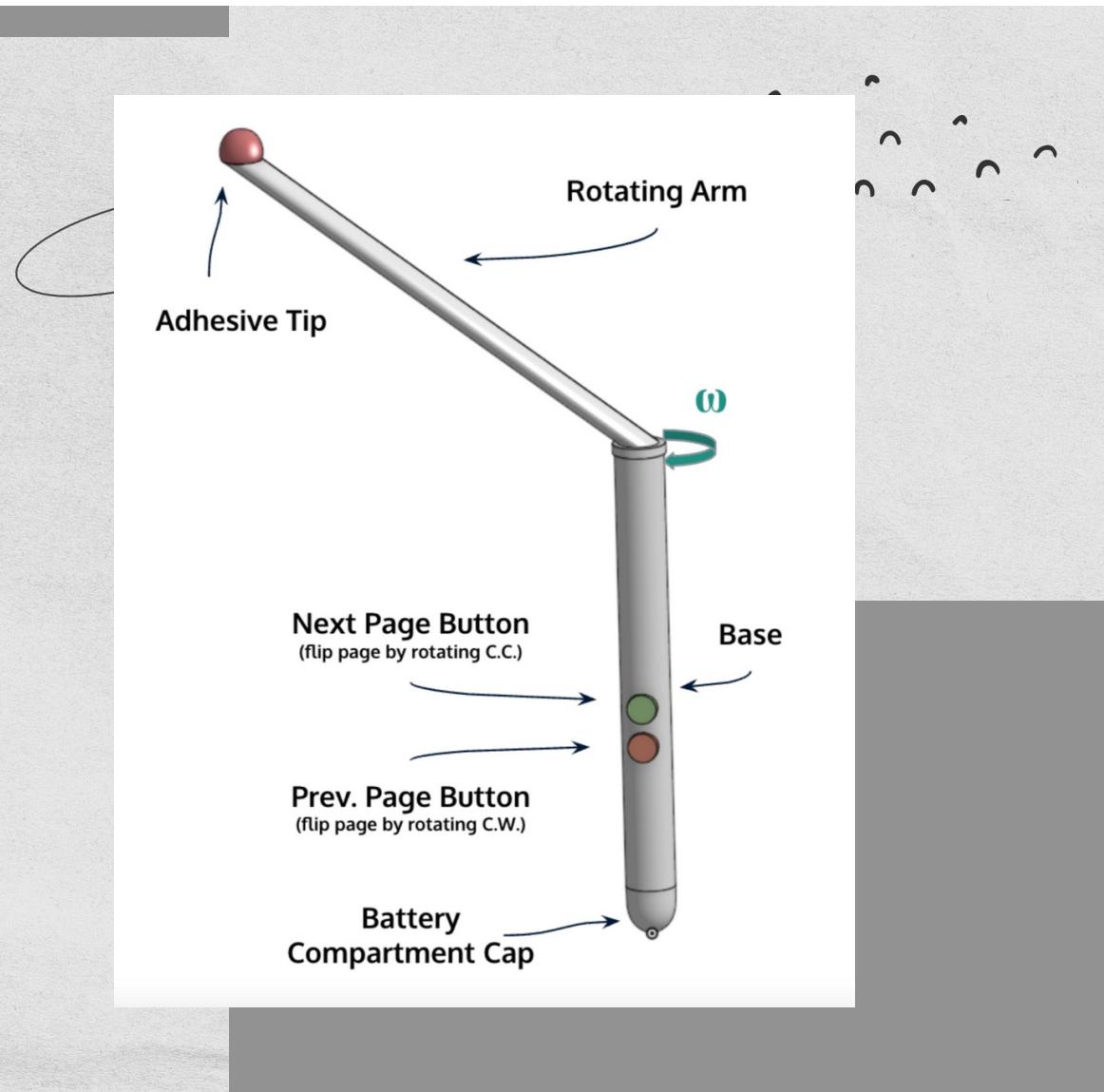


REQUIREMENTS

#	Level Value	Requirement Type	Requirement Statement
1	1	Functional	Turn a page via accessible user input, ie., press of a button.
2	1	Cost	Device costs less than \$100.
3	1	Functional	Must not cause damage to the book.
4	1	Functional	Must not hurt the user.
5	1	Functional	Can turn pages both forwards and backwards.
6	2	Functional	Page turns within 15 seconds.
7	2	Physical	Device weighs less than 5 pounds.
8	2	Physical	Portable size within 1 cubic foot.
9	3	Functional	Adjustable to different book sizes and thicknesses, as well as page thinnesses.
10	3	Functional	Able to be powered for 2+ hours of reading in a row at minimum.
11	3	Appearance	Can be made aesthetically pleasing for the user, using favorite colors and designs.
12	3	Appearance	Has handles or other ways with which to move the device.

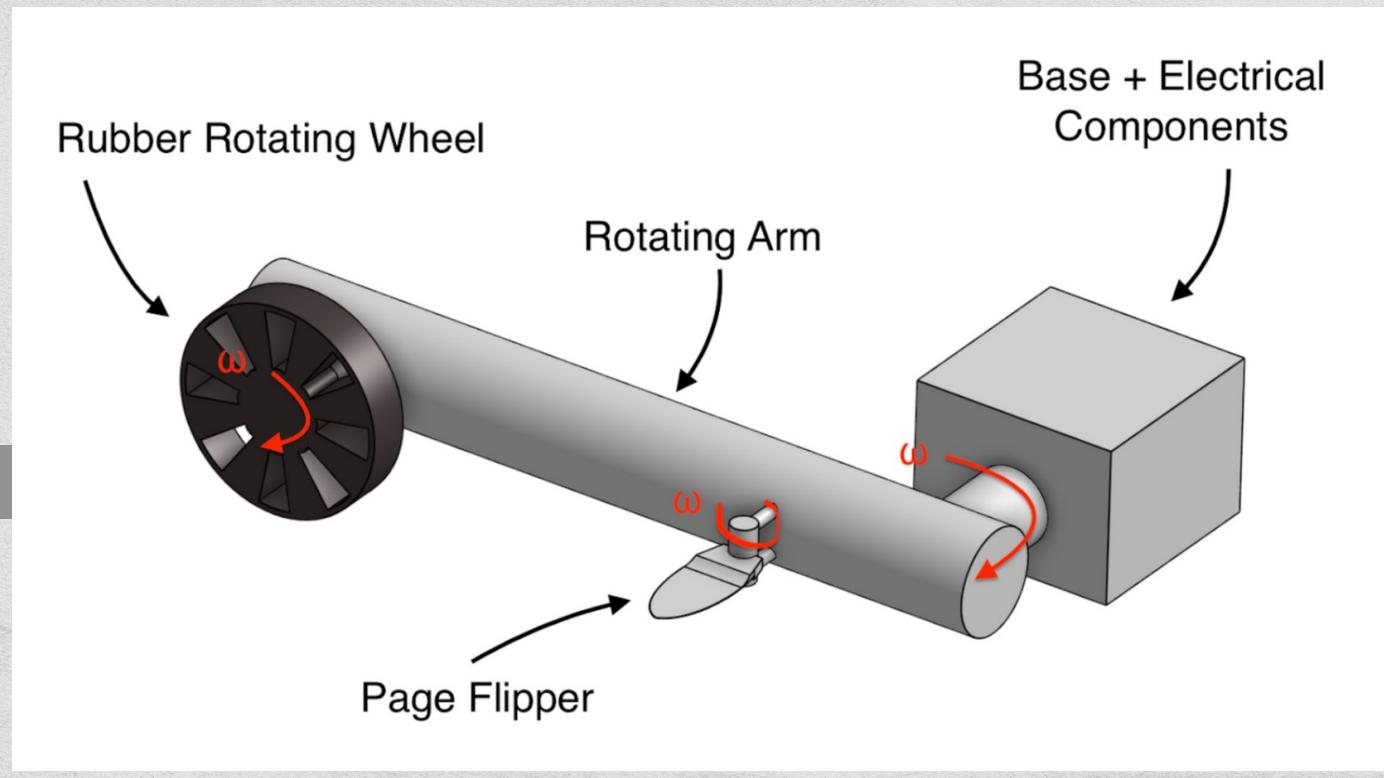
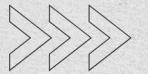
PDR DESIGN 1

THE WAND



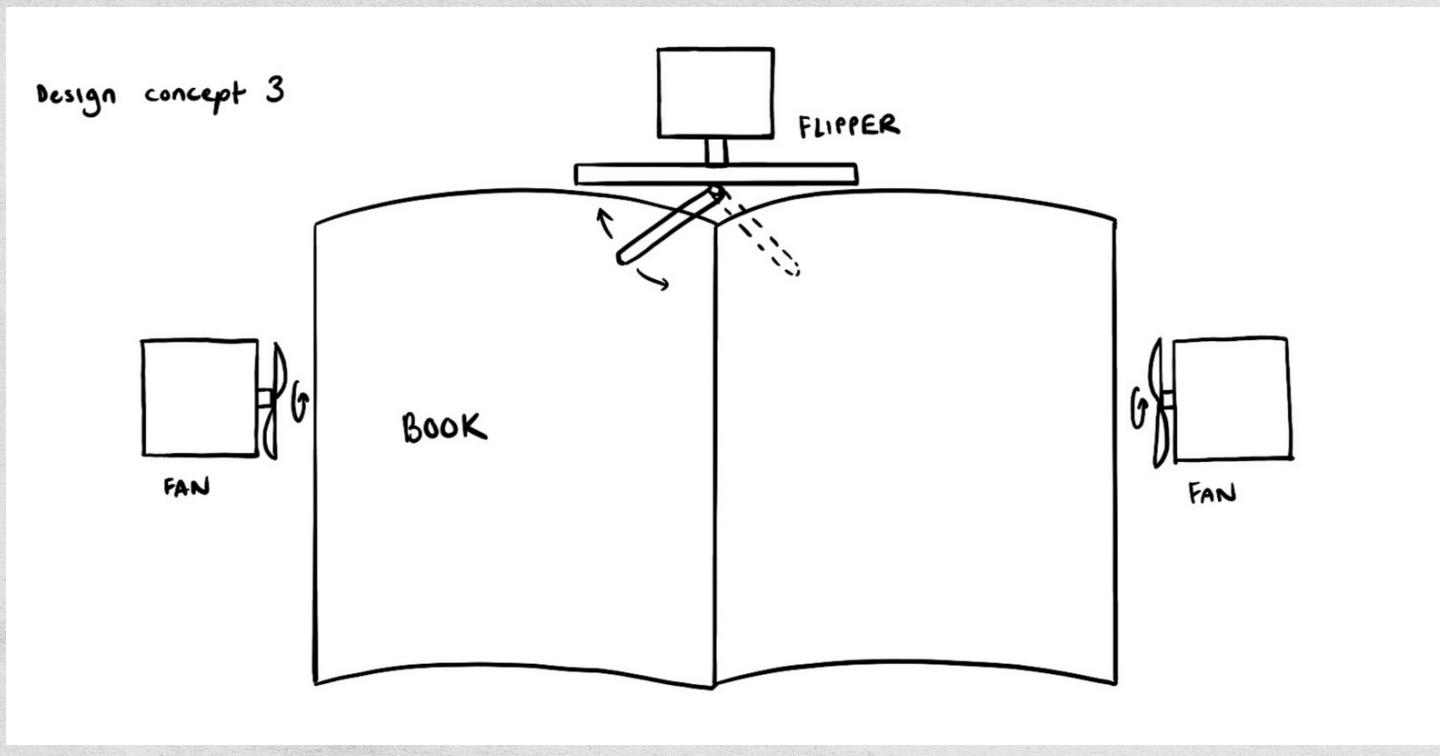
PDR DESIGN 2

FLIPPING ARM



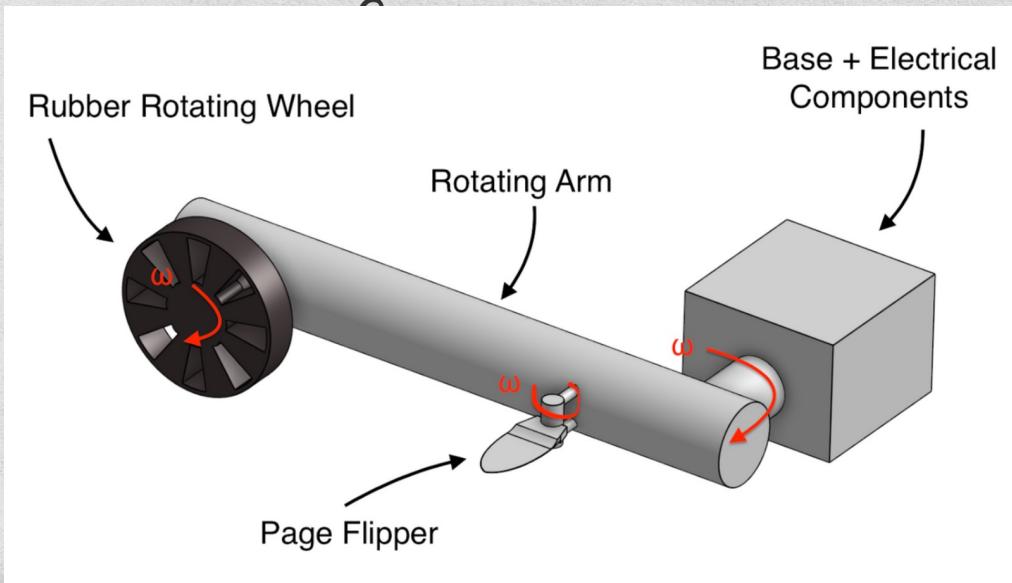
PDR DESIGN 3

YOUR BIGGEST FAN



CDR DESIGN

PDR

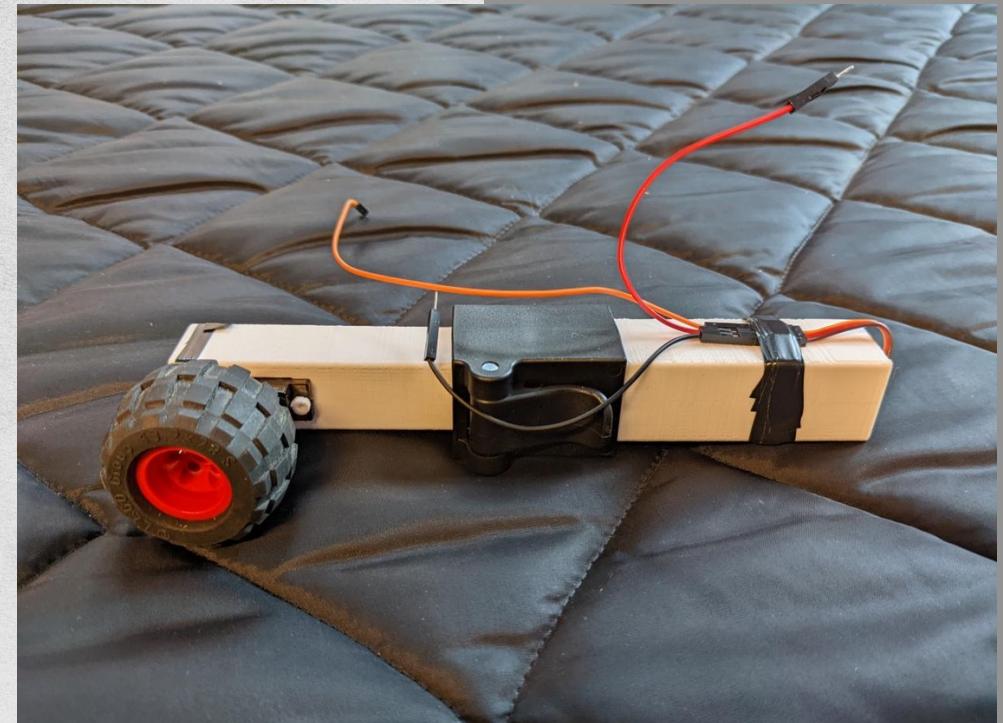


CDR



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BUILD PROCESS



ITERATION 1

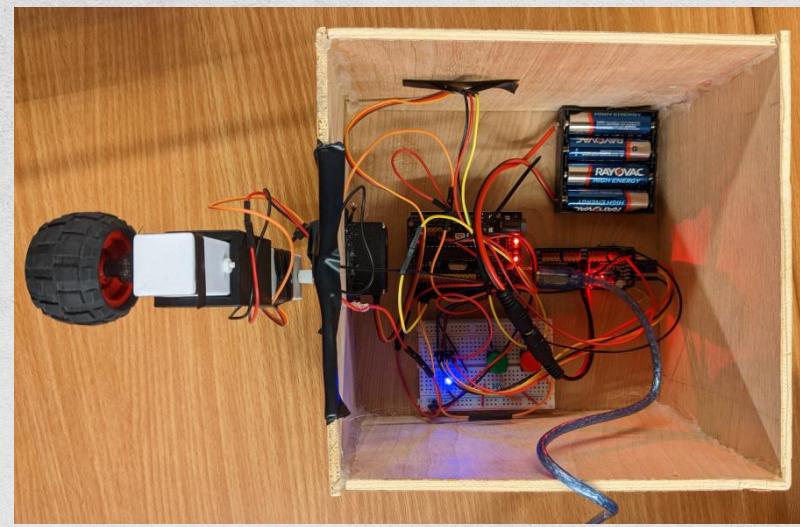
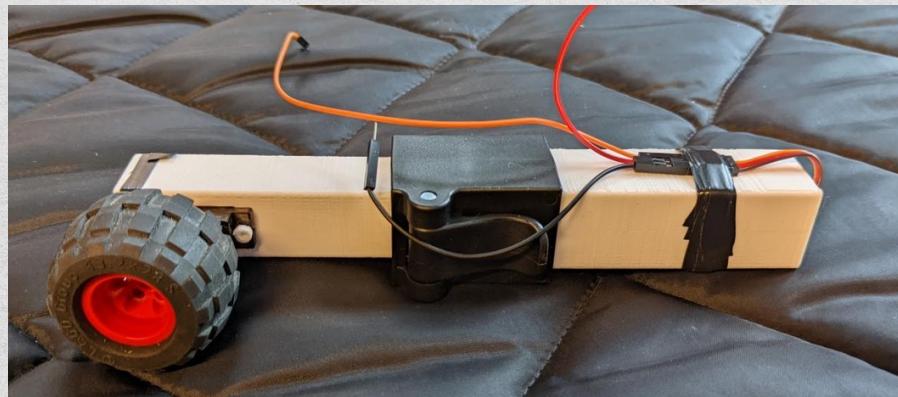
- PVC pipe body (not extendable)
- Plastic tire wheel with hot glue additions
- No clamps or flipper yet



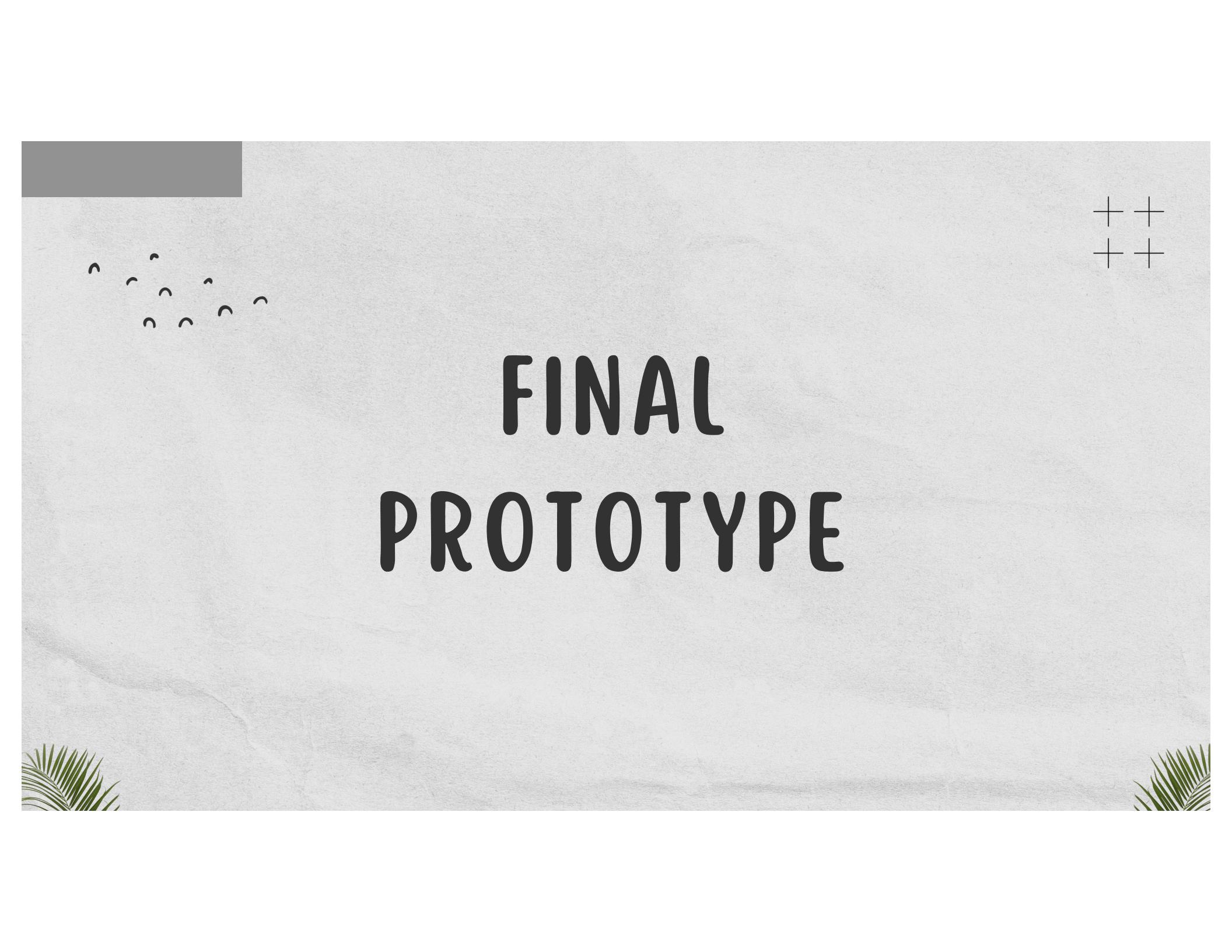
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ITERATION 2

- 3D printed body
- Extendable
- Smaller and more grippy wheel
- Plywood electrical housing

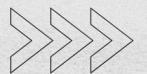
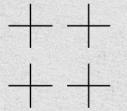
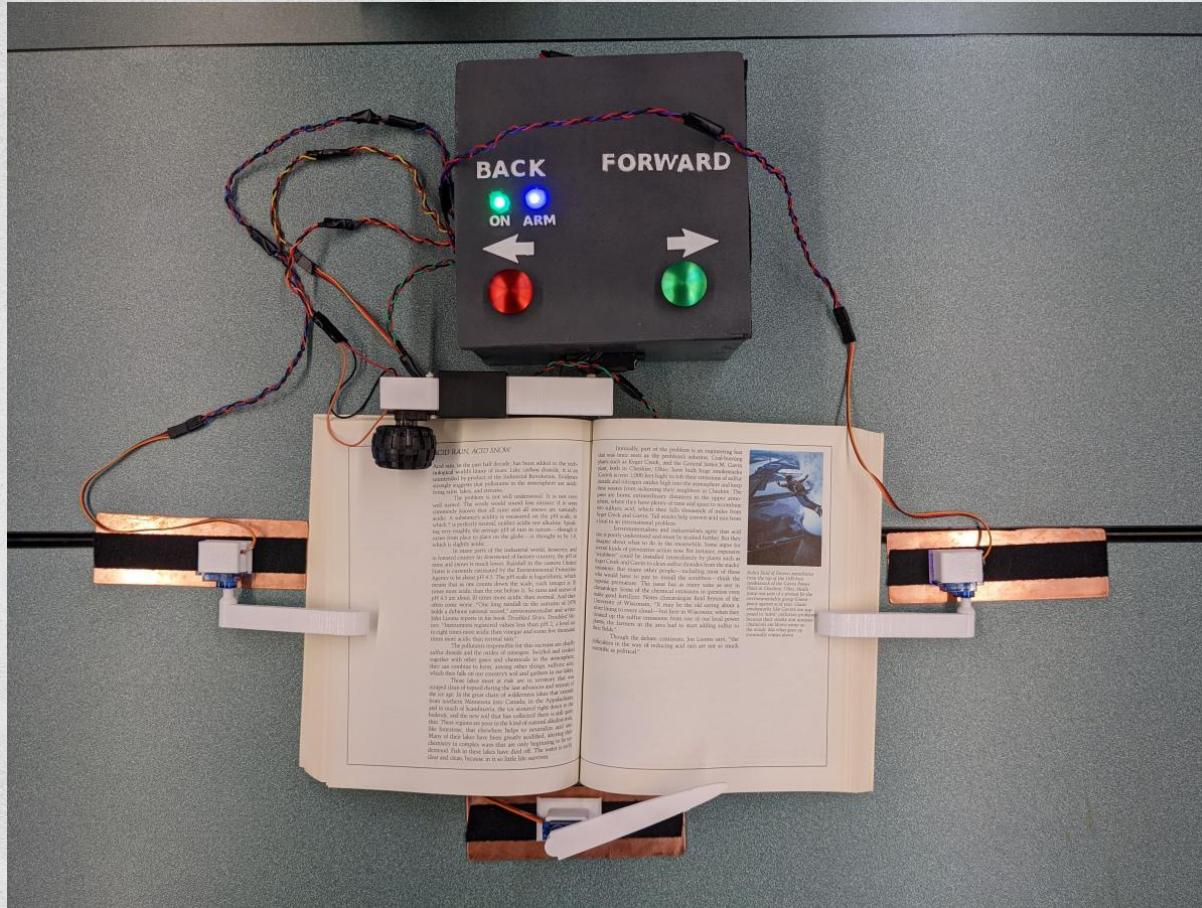


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FINAL PROTOTYPE

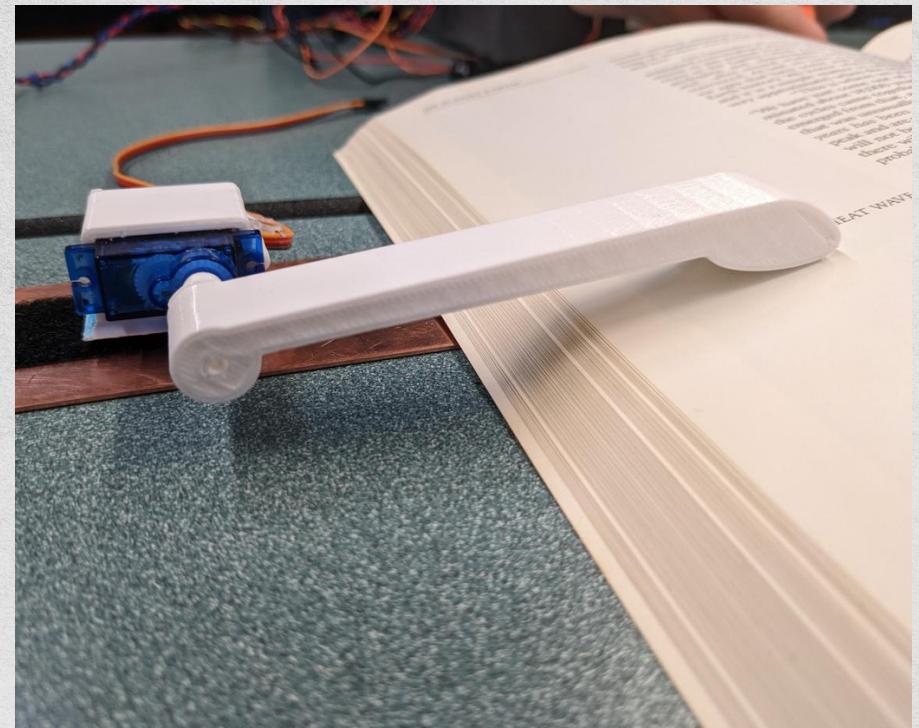
FROM ABOVE



CLAMPS AND FLIPPERS



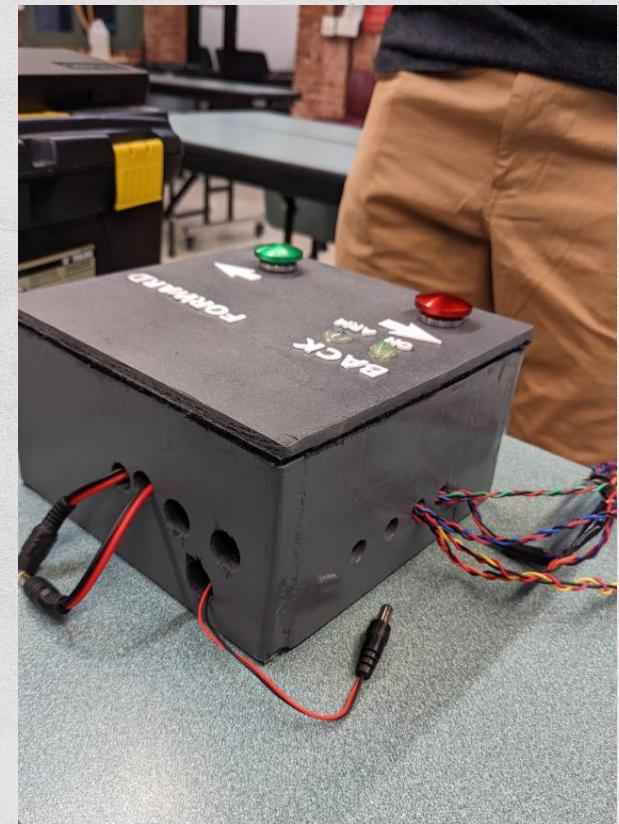
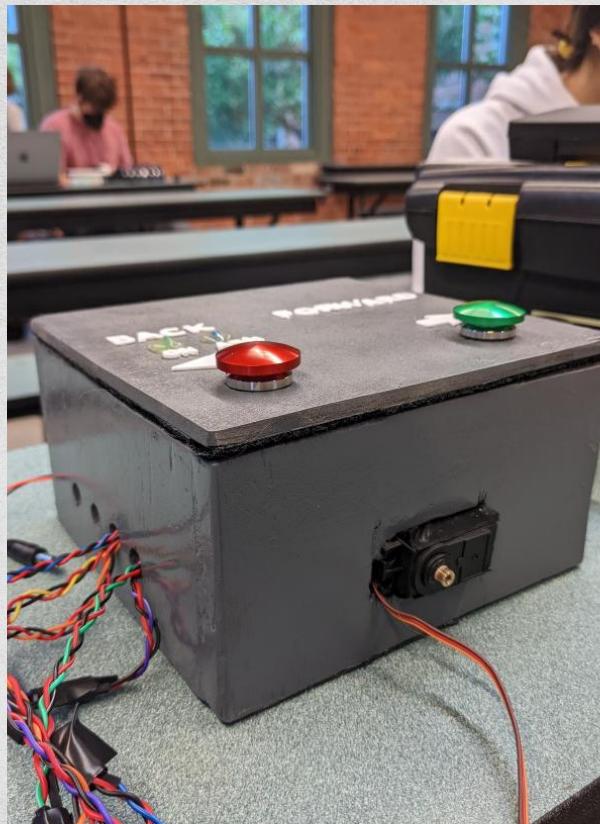
The flipper: located at the bottom of the book, responsible for flipping the page by inserting itself in the crease of the page and pushing it over



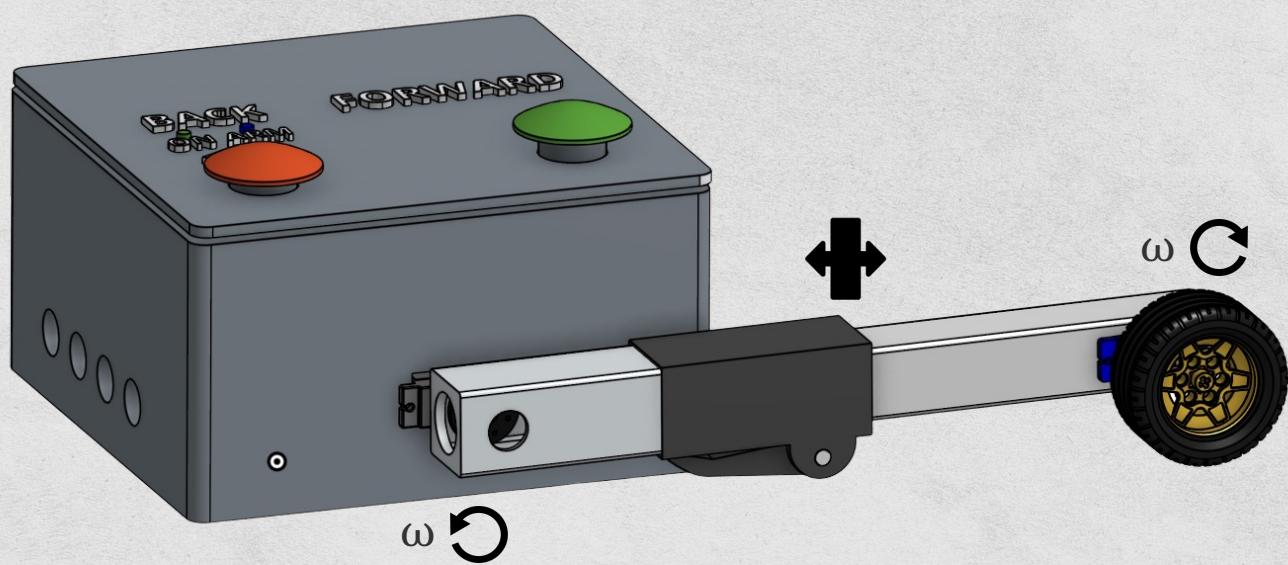
The page clamp: located on either side of the book, lifts and lowers during process and holds pages down



BOX

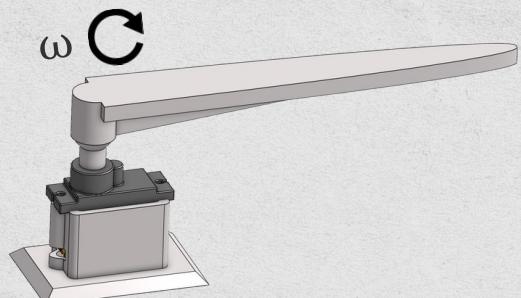


CAD

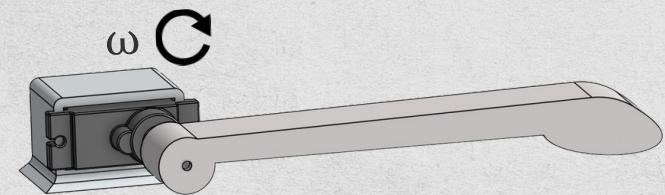


Rotating Arm + Electrical Housing

VISIT QR CODE TO VIEW ALL
CAD FILES AND DIAGRAMS



Page Flipper Assembly



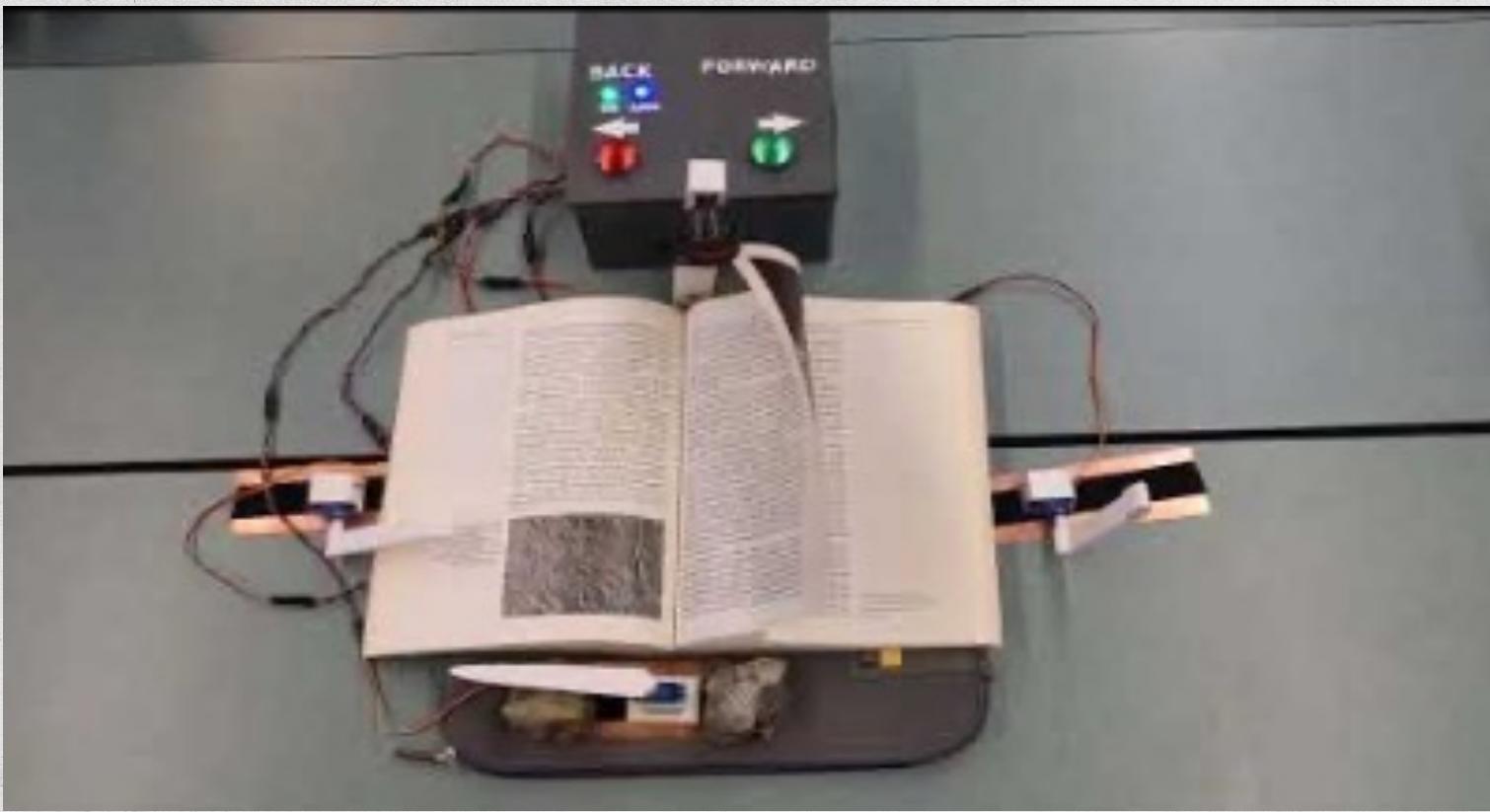
Page Clamp Assembly



FINAL REQUIREMENTS

Level	Type	Requirement Statement	PASS/FAIL
1	Functional	Turn a page via accessible user input, ie., press of a button.	PASS
1	Cost	Device costs less than \$100.	PASS
1	Functional	Must not cause damage to the book.	PASS
1	Functional	Must not hurt the user.	PASS
1	Functional	Can turn pages both forwards and backwards.	PASS
2	Functional	Page turns within 15 seconds.	PASS
2	Physical	Device weighs less than 5 pounds.	PASS
2	Physical	Portable size within 1 cubic foot.	PASS
3	Functional	Adjustable to different book sizes and thicknesses, as well as page thinnesses.	PASS
3	Functional	Able to be powered for 2+ hours of reading in a row at minimum.	PASS
3	Appearance	Can be made aesthetically pleasing for the user, using favorite colors and designs.	PASS
3	Appearance	Has handles or other ways with which to move the device.	FAIL

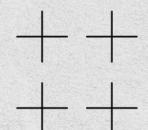
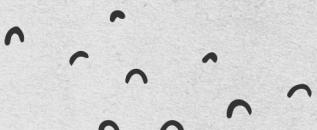
DEMONSTRATION



<https://youtu.be/hYUFaQKX1MY>

FUTURE STEPS

- Develop voice-based user input
 - More accessible than buttons
- Build a mount for all components
 - Suitcase-style design?
- Continue to refine page turning process
 - Add a dial to change arm angle (for thicker or thinner books)



THANK YOU!

QUESTIONS?

