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OBJECTIVE

Inceptus wants an easy to use electric airplane tug that works with a wide variety of tire sizes as well as aircraft with wheel pants.



PROBLEM

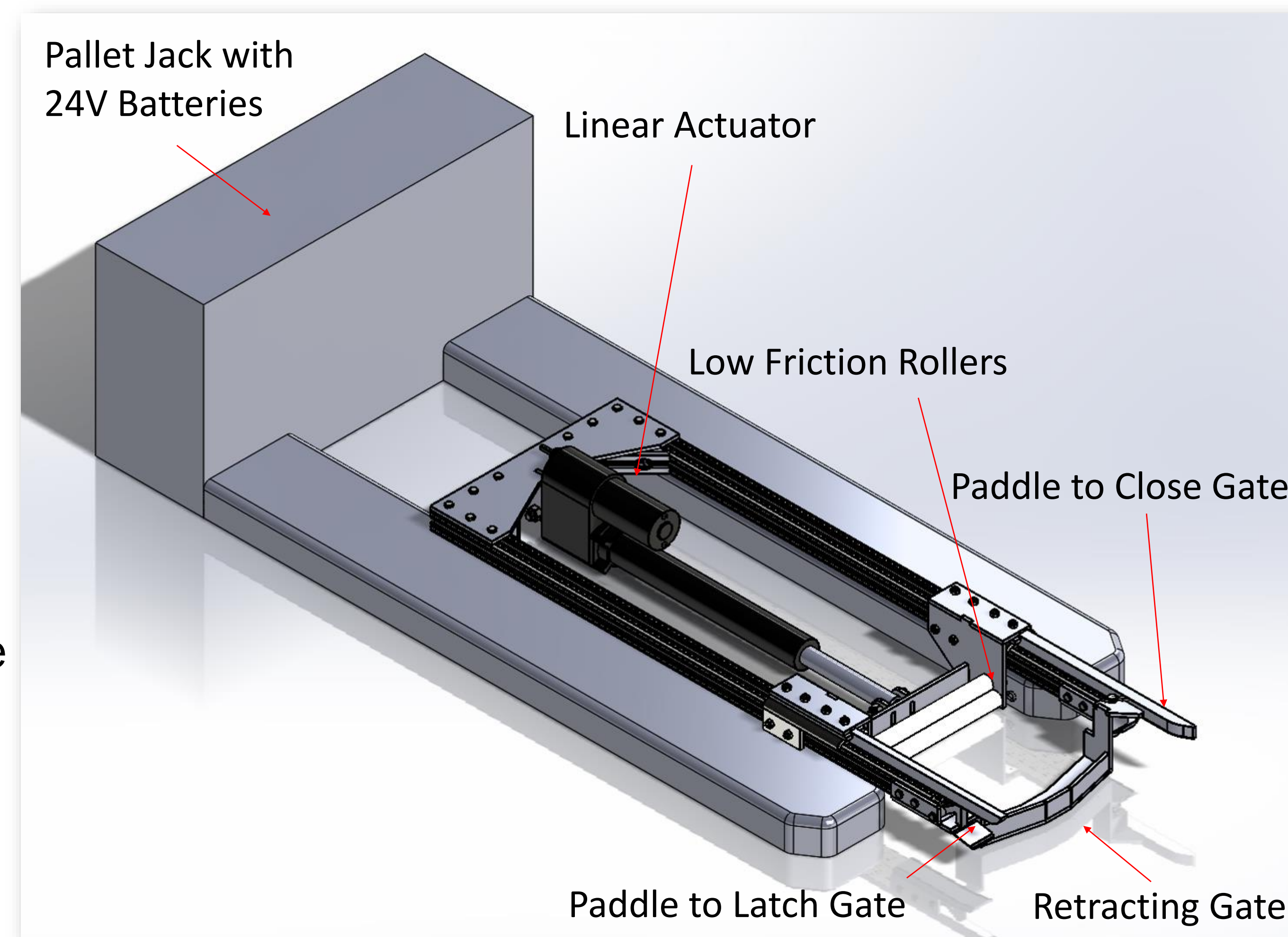
Moving an aircraft around takes a lot of energy. Especially when going up hill. Currently, there are many powered tugs on the market, but none that can accommodate a wide range of tires. We came up with a design that is easy to use, and can capture a wide range of tire sizes.

REQUIREMENTS

- I Pull 4,000 lbs up a 2% grade
- I Carry a 500 lb static load
- I Move aircraft with variety of tire sizes including wheels with pants
- I Capture tires from 4 inches to 16 inches in diameter

DESIGN

- I The linear actuator pushes the clamp with low friction rollers
- I As the actuator goes forward, one paddle closes the gate and the other pushes a latch down to hold the gate shut
- I The gate and latch are attached to torsion springs which hold them in the open position
- I Used a slot and key design with laser cut parts to ensure a precise fit when building



VALIDATION

- I In testing we found that our design meets the requirements
- I We ran it through multiple cycles and tested it on multiple aircraft with no problems



SUMMARY

- I We created a system that clamps wheels with different diameters with a push of a button
- I Self closing and opening gate
- I Product will be mounted to an electric pallet jack



ACKNOWLEDGEMENTS

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