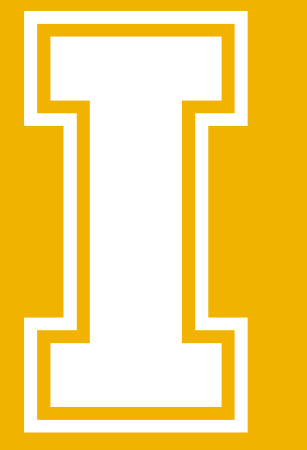


SINGLE ACTION TILT AND TELESCOPE STEERING COLUMN



ANDREW FERRERO, MATTHEW HURLEY, MARCUS JOHNSON, AND KATIE WARD

Objective

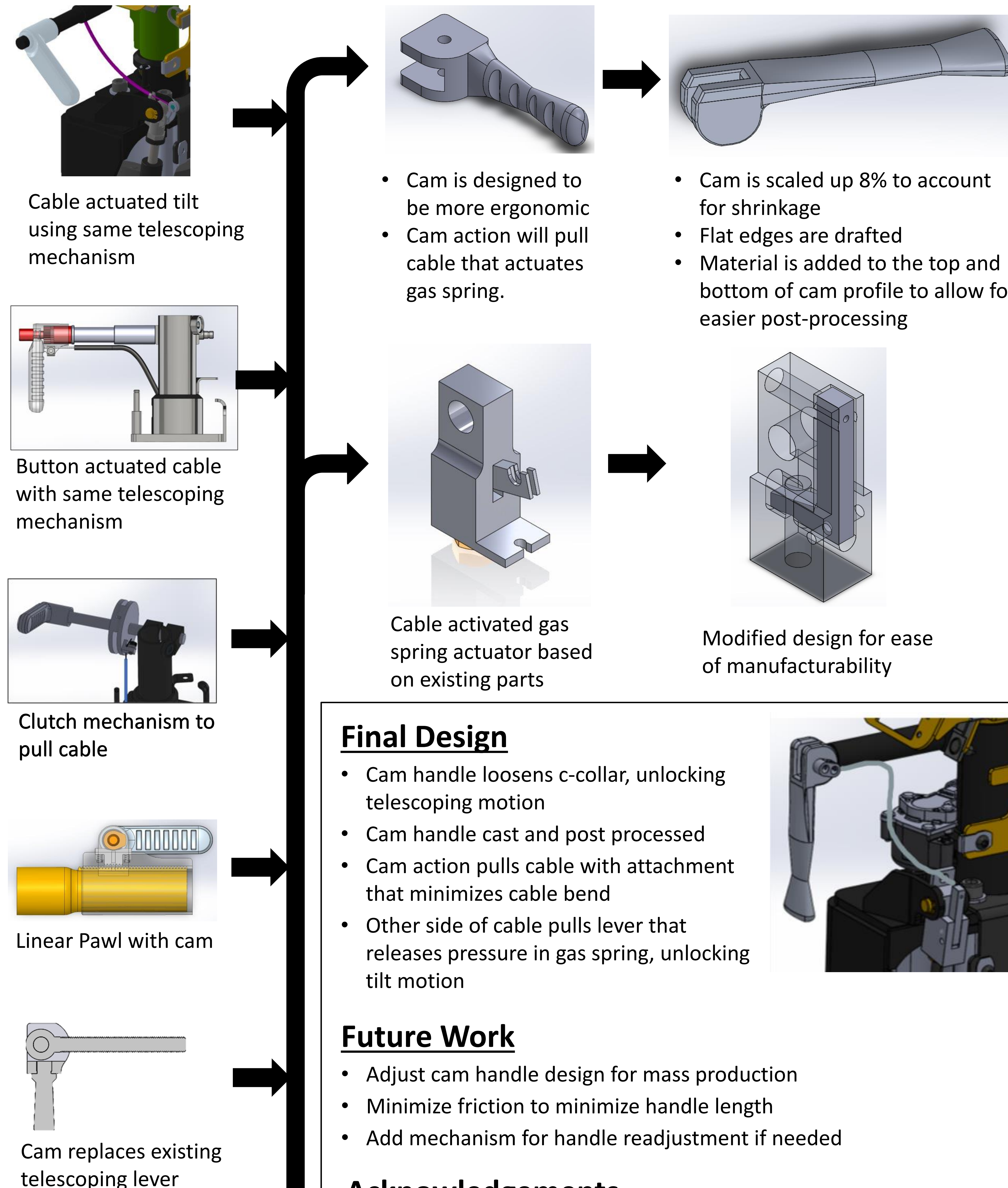
- Merge the two adjustment motions into a single action such that adjustments can be performed simultaneously without holding the locking mechanism open



Value Proposition

- Adjusting tilt and telescope separately is time consuming
- Performing these adjustments simultaneously would reduce downtime and increase efficiency
- A similar mechanism already exists in passenger vehicles

Concept Development



Final Design

- Cam handle loosens c-collar, unlocking telescoping motion
- Cam handle cast and post processed
- Cam action pulls cable with attachment that minimizes cable bend
- Other side of cable pulls lever that releases pressure in gas spring, unlocking tilt motion

Future Work

- Adjust cam handle design for mass production
- Minimize friction to minimize handle length
- Add mechanism for handle readjustment if needed

Acknowledgements

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Key Product Requirements

- Make adjustments faster and easier for the operator
- Preserve existing range of telescope and tilt adjustments
- Steering column must withstand axial force of 300 lbs.
 - Safety procedure in the event of a tip over
- Minimize changes to existing structure

Design Validation

Requirement	Result
New design must fit in existing steering column cover	New mechanisms occupy same spaces, existing cover will still work
Tilt motion will operate between 0 and 32 degrees and telescope will extend 66 mm	Locking mechanisms remain unchanged therefore motion remains the same
Lever should not extend outward further than 10 cm	Lever is slightly larger than this to minimize force
Maximum lever effort shall not exceed 36N (~8lbs)	Current lever effort is 35 N. Found through equilibrium equations
Device will have an allowable deflection of ± 0.5 degrees tilting and axially ± 2 mm	Locking mechanisms remain unchanged therefore deflection remains the same