Wall Crawler

Impossible Heights

Dual-Shaft Wall Ascent and Decent Robot

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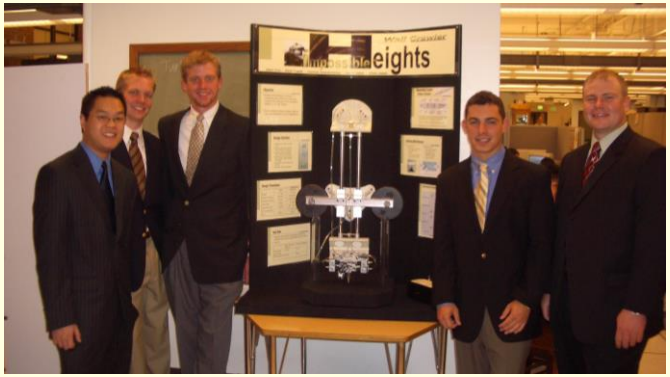
Goal: Design and prototype a remote-controlled device that can crawl up a vertical wall carrying a 10 lb payload in addition to its own weight. Air and Electric power supplies may be used and attached via an umbilical cord.

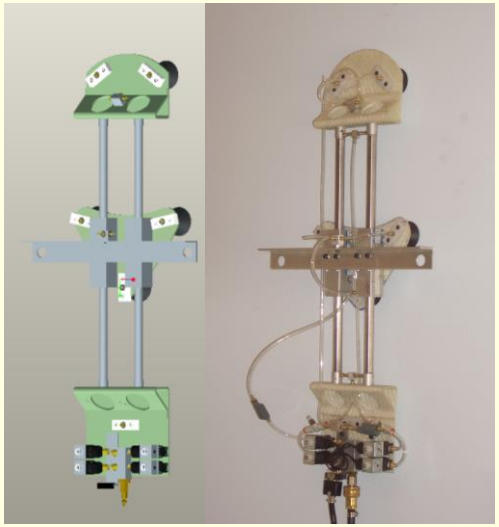


	Goal	Achieved
Weight	< 10 lbs	7.5 lbs
Design Envelope	24”x8”x6”	32”x16”x6”
Payload Capacity	10 lbs	12 lbs (FS = 2)
Climb Rate	5 ft/min	6 ft/min
Operating Press.	< 100 psi	80 – 100 psi
Air Consumption	X	2.5 scfm (max)
Cost	$200	$260.90

Design Solution

- Adhesion through vacuum cups
- Venturis generate vacuum from positive air pressure
- Vertical motion achieved with rod-less air cylinders
- Rigid frame constructed of light weight / high strength composite
- Solenoids control system air delivery
- Remote control operated

Pro-E **Prototype**



Design Highlights

- Low Profile (6”)
- Lightweight (7.5 lbs)
- Relatively Quiet
- Versatile Applications
  - Cleaning/Painting
  - Wiring Within Walls
  - Carrying Tools, Supplies
  - Surveillance
  - Lighting
- Design Simplicity

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