NASA SOFTGOODS ATTACHMENT DEVICE

NASA Micro-g NExT Challenge

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CHALLENGE

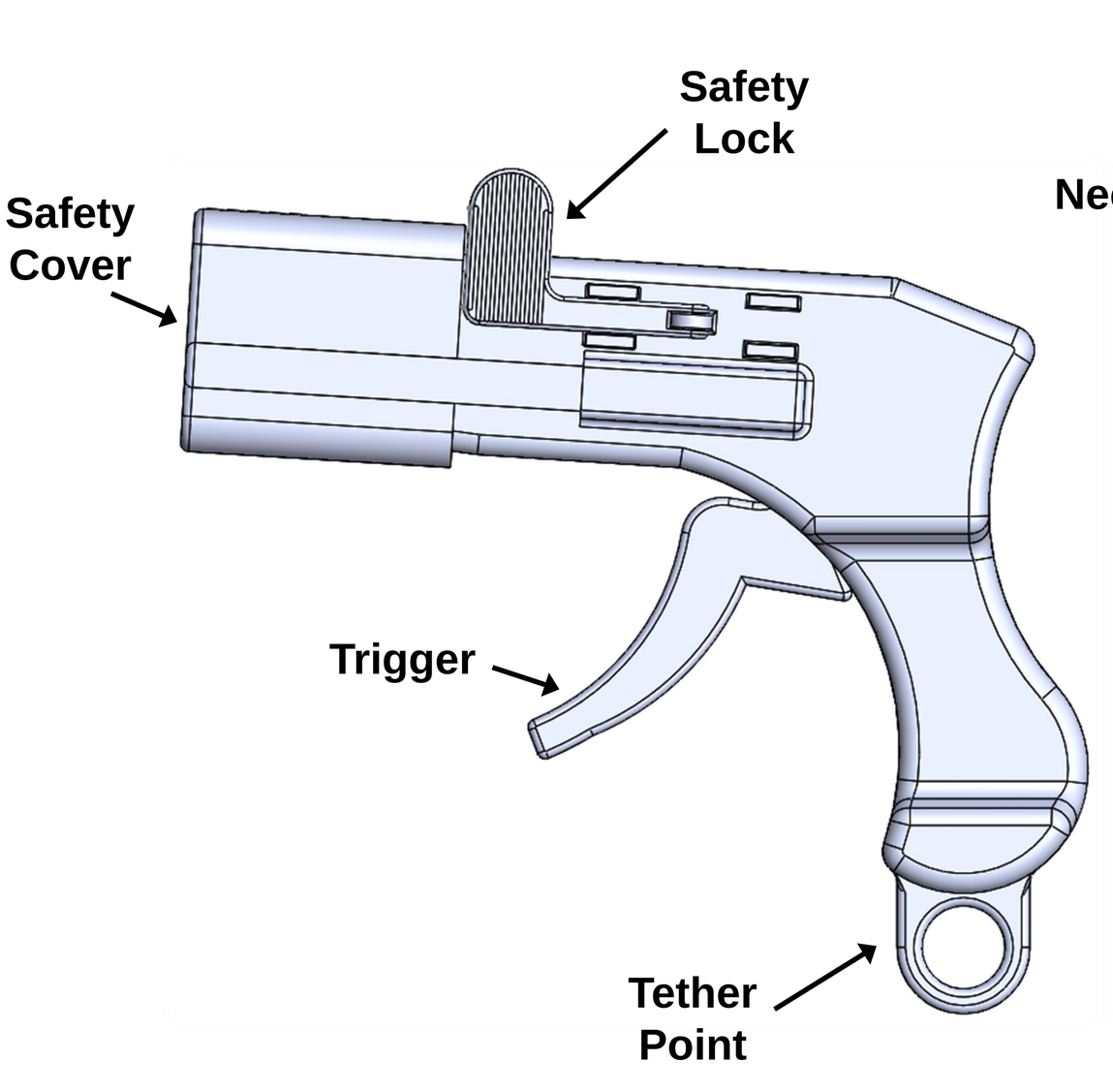
Design a device that astronauts can use during extravehicular activity (EVA) to permanently attach two pieces of softgoods together, while only accessing one side of the material. Ensure efficient installation of thermal materials on the ISS with a durable and spacesuit-compatible tool.

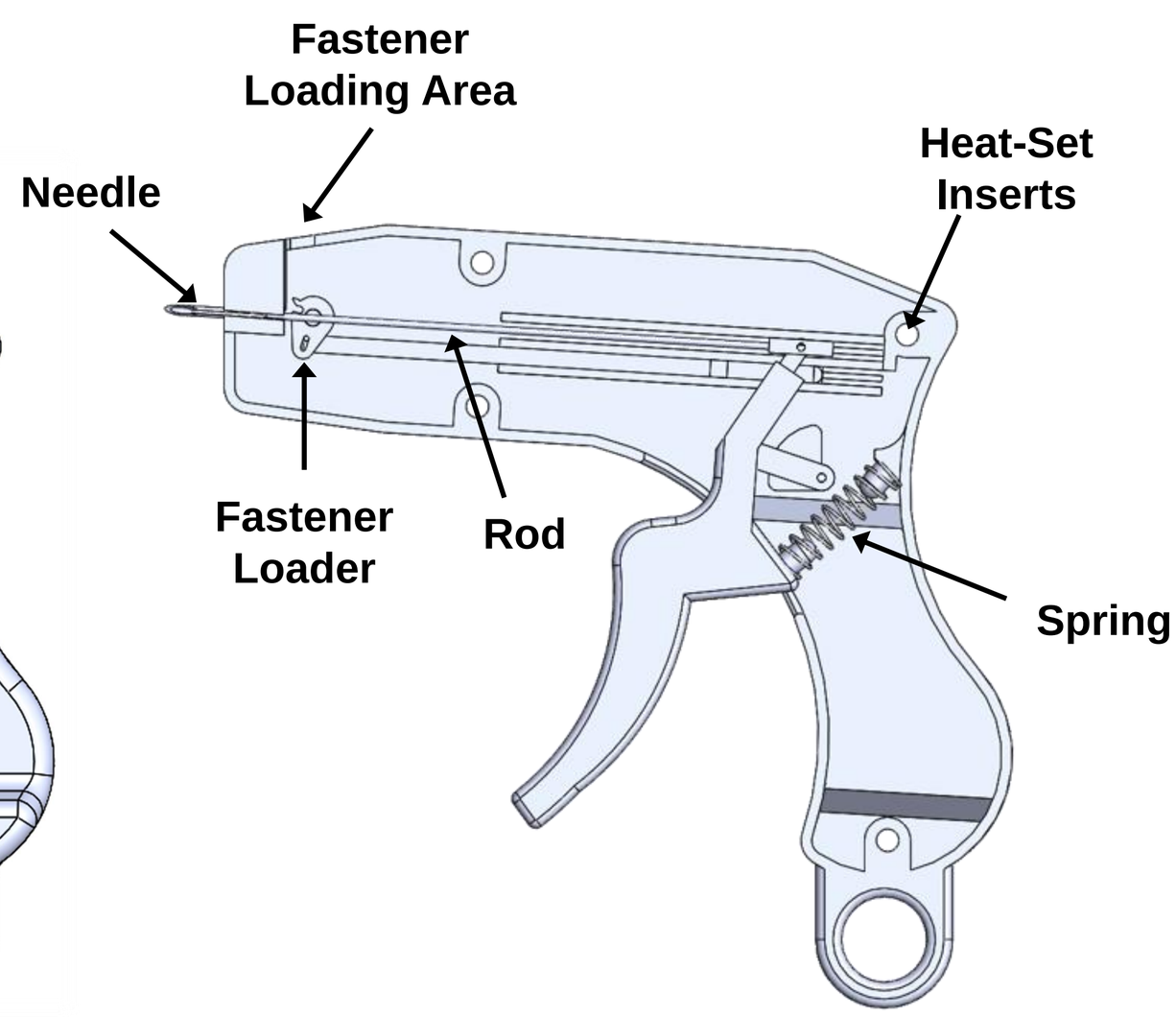
Component	Material
Safety Cover, Safety Lock, Trigger, Main Shell	Tough PLA
Springs, Screws, Rod, Needle	Stainless Steel
Heat-set Inserts	Aluminum
Fasteners	Tenacious Clear Resin, SIRAYA Tech
Adhesive	Epoxy

DESIGN

The Star Shooter is a single-handed tacking device. When the trigger is pulled, one end of a fastener is inserted through the softgoods using a hollow needle, securing the softgoods between both ends of the fastener. A safety cover keeps the needle inaccessible when not in use, held in place by the safety lock.

THE STAR SHOOTER



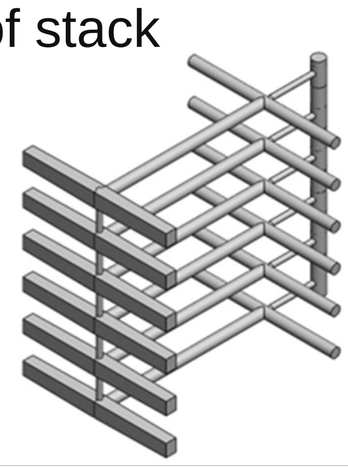


REQUIREMENTS

- Attach two layers of softgoods
- Stowed within 12” × 12” × 12” volume
- Weigh less than 10lbs
- Withstand a bump load of 30lbf
- Have a factory of safety > 2
- Sharps must be > 3” from hand and inaccessible when not in use
- Ability to sink in water

FASTENERS

- Deposit each end on either side of material
- One breaks apart from rest of stack



OUTREACH

- Montessori Children’s House of Laramie
- 6th Grade class
- Introduced engineering design process
- Astronaut landing pod egg drop challenge
- Space suit material design challenge