

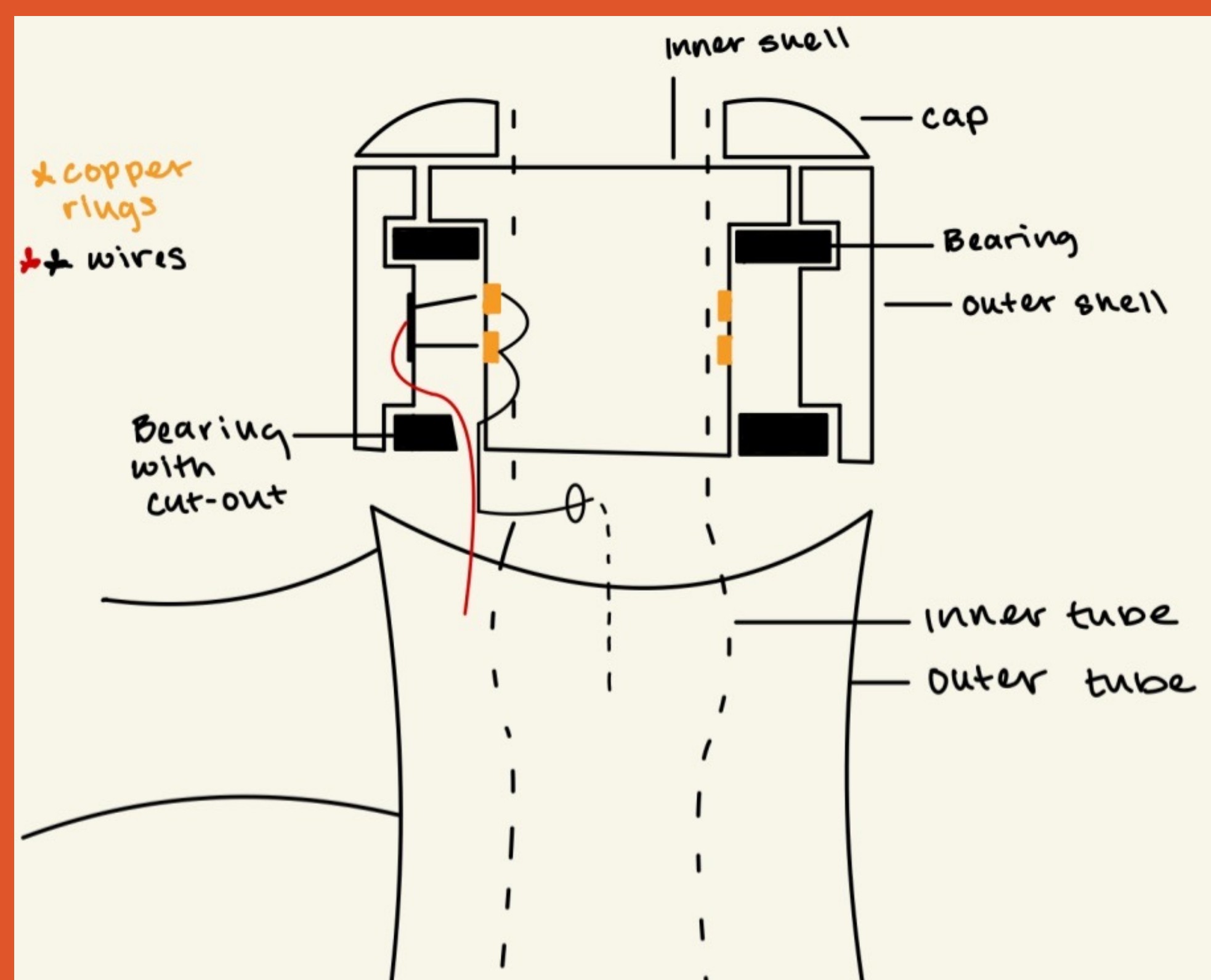
BACKGROUND

The cycling community is in a constant state of problem solving to adequately outfit their bicycles. Having power for lights or charging devices, space for traveling packs, and hydration are all necessary for touring, commuting, and traveling cyclists. Our team aimed to provide a solution for distributing power throughout the bike using a slip ring within the headset tube

DESIGN REQUIREMENTS

- 1: Transmits enough power from the generator hub located on the front wheel to power a headlight and taillight.
- 2: Power is delivered without any problems or wire breaks.
- 3: Eliminates tangled wires and the risk of wiring system damage through internal wiring
- 4: The electrical connections between the handlebars and the front wheel are kept secure while the wheel is turning.
- 5: The device fits inside of the headset and is integrated into the manufacturing process

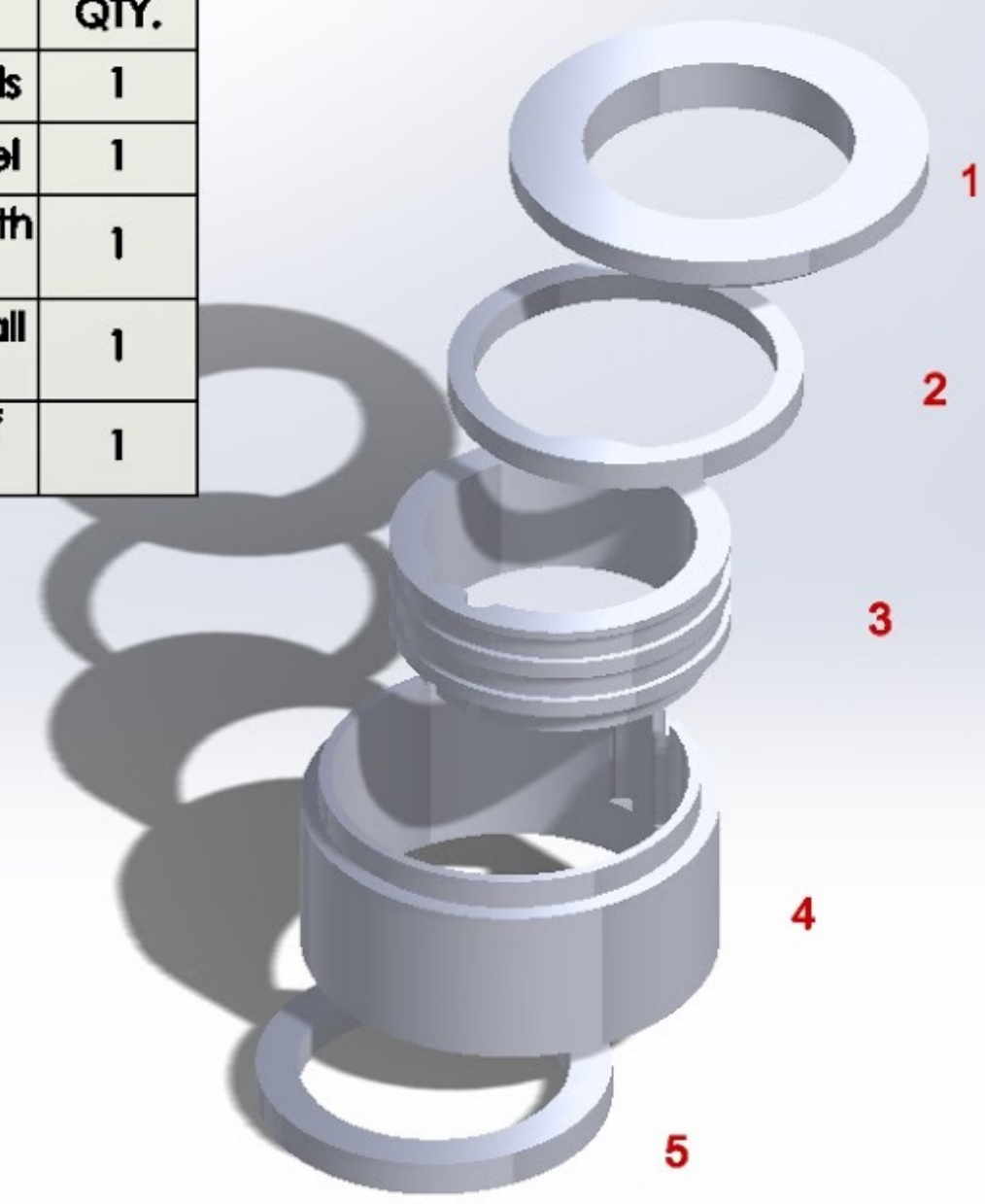
INITIAL CONCEPT DESIGN



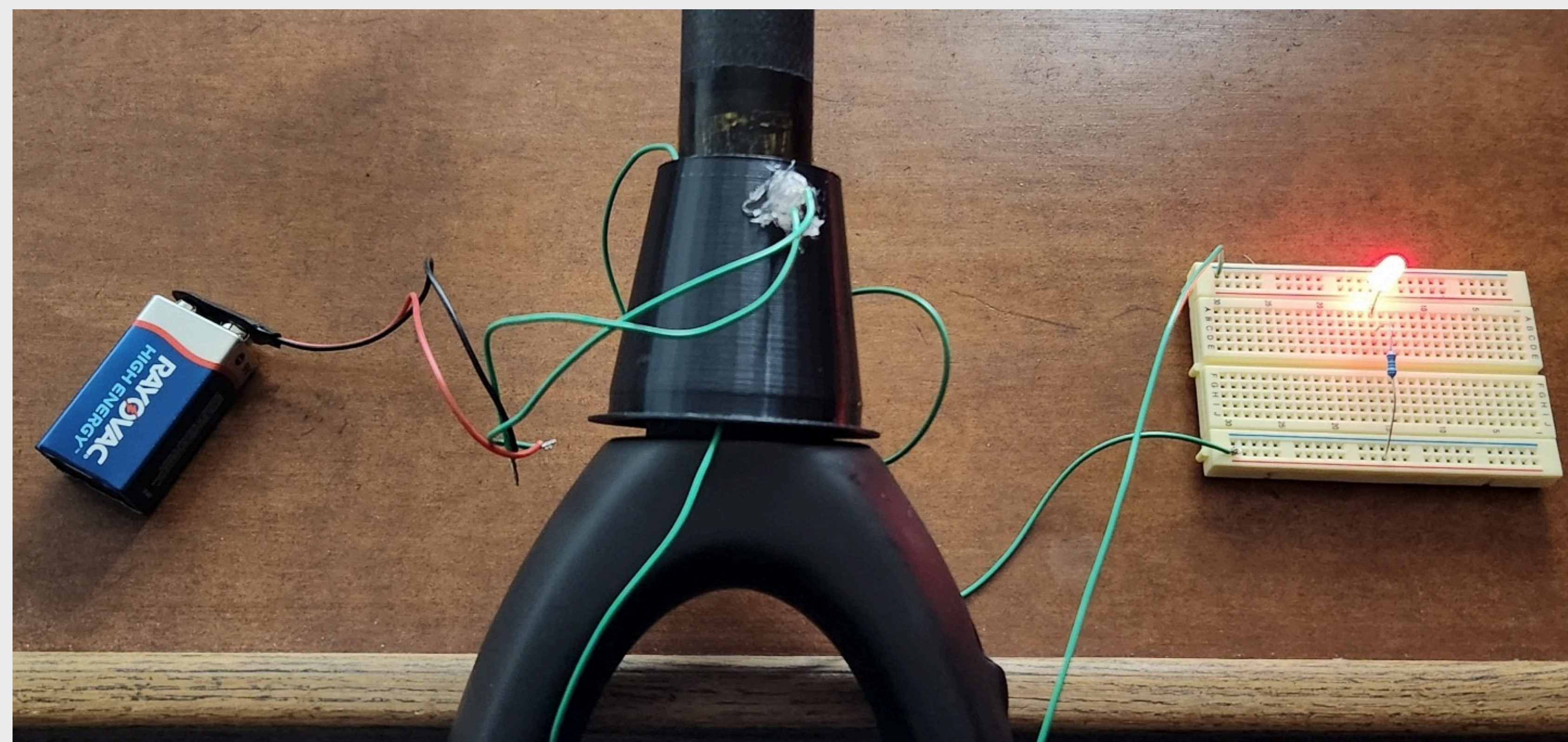
HEADSET SLIP RING

Team Members: Trinity Norriss, Naif Alqahtani, Khaled Almansouri, Stephen Morley
 Sponsors: Dr. Scott Campbell, Dr. Ross Hatton, Celilo Cycles

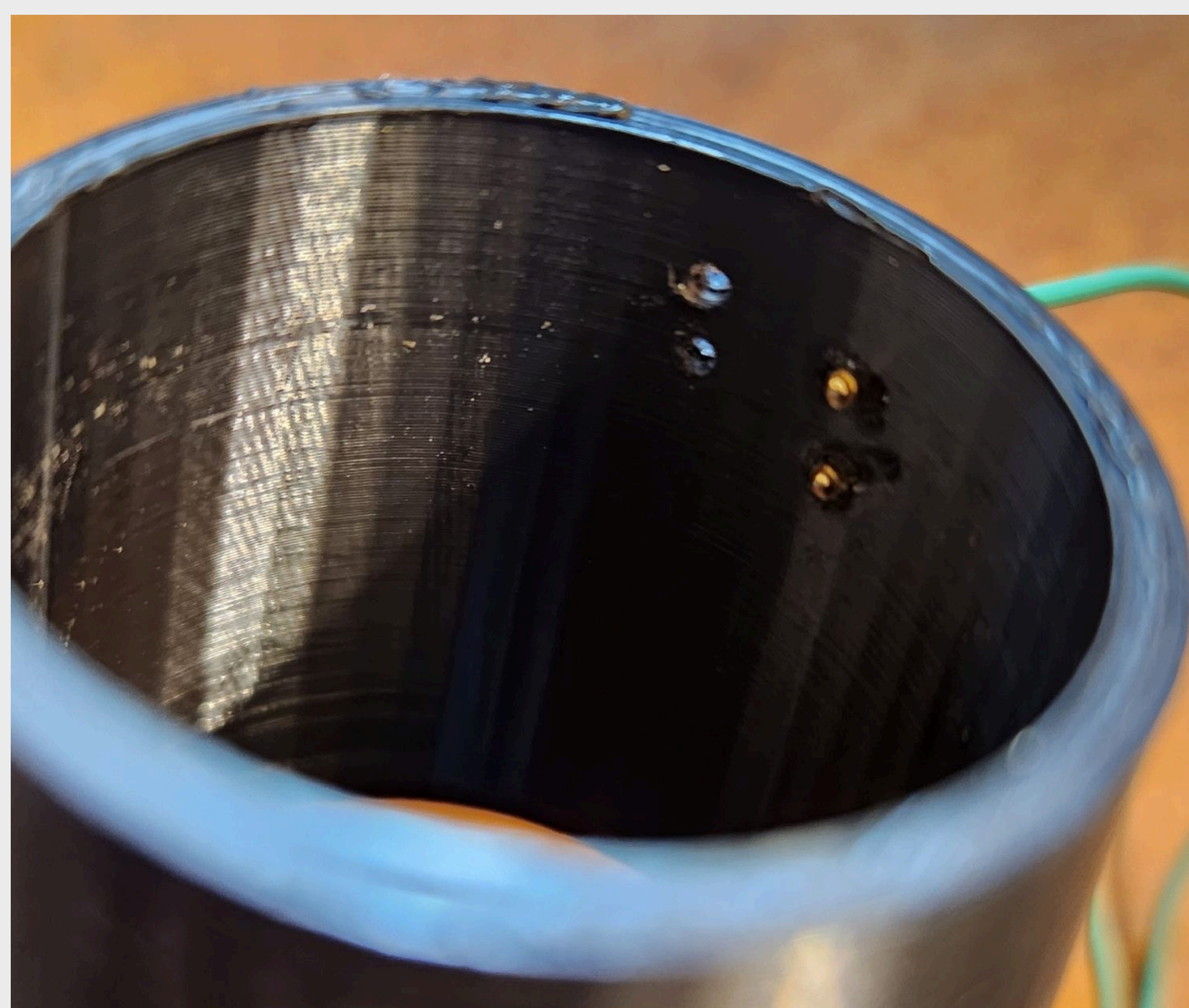
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	Cap	Aluminum w/ Rubber Seats	1
2	topbearing	Top Bearing made of Steel	1
3	innershell	Plastic (Polyetherimide) with Copper Rings	1
4	outershell	Aluminum with Brushes: Ball detents or leaf springs	1
5	bottombearing	Bottom Bearing made of Steel	1



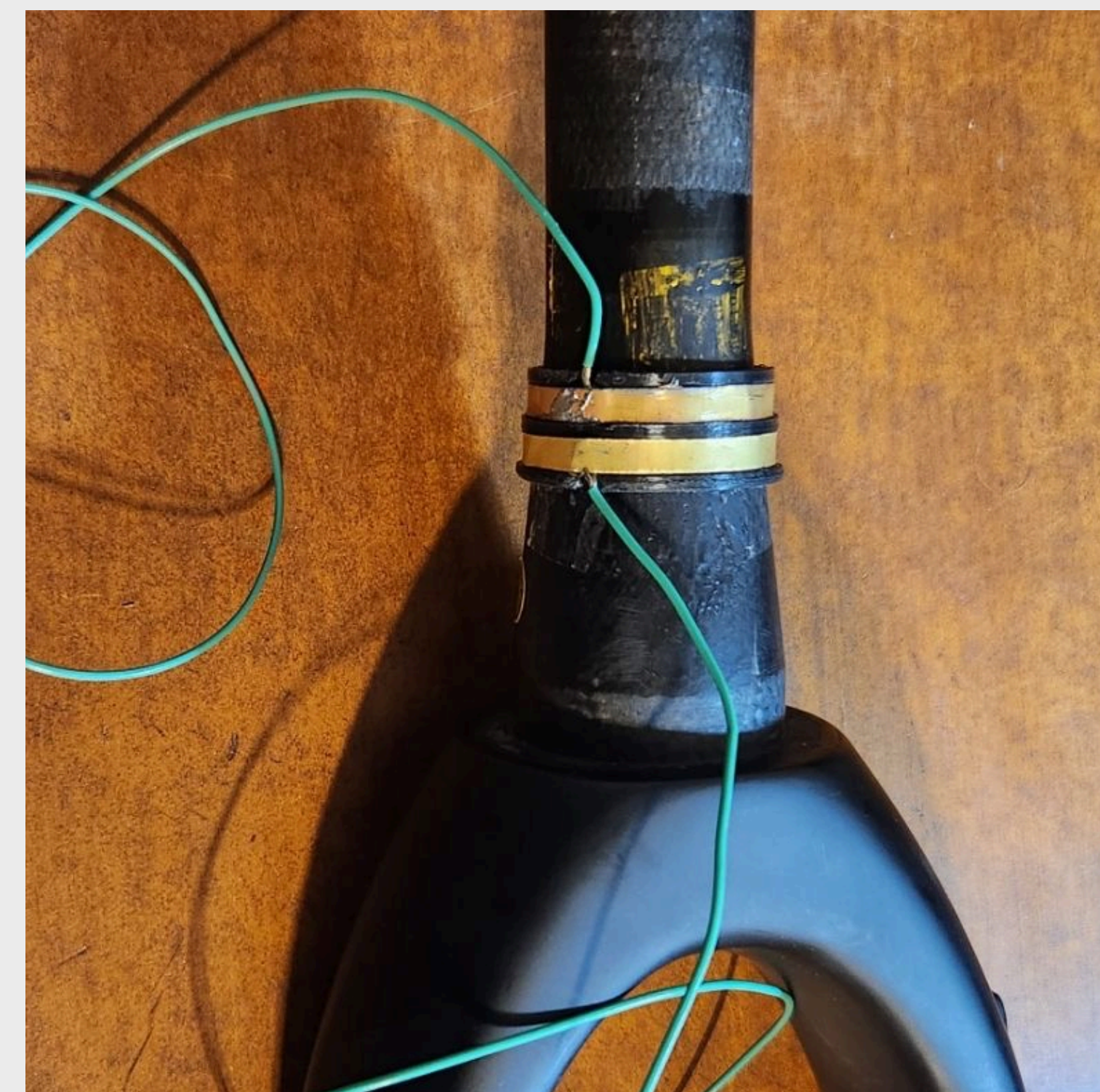
INSIDE THE HEADSET



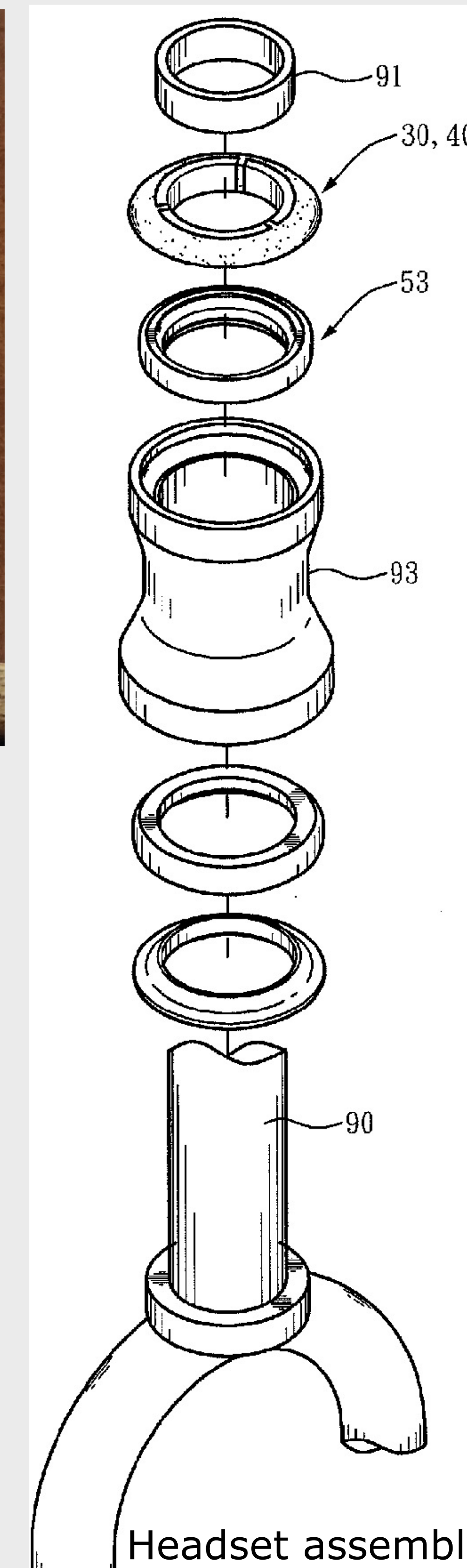
Functional assembly



Conductive ball detents



Conductive copper rings



Headset assembly

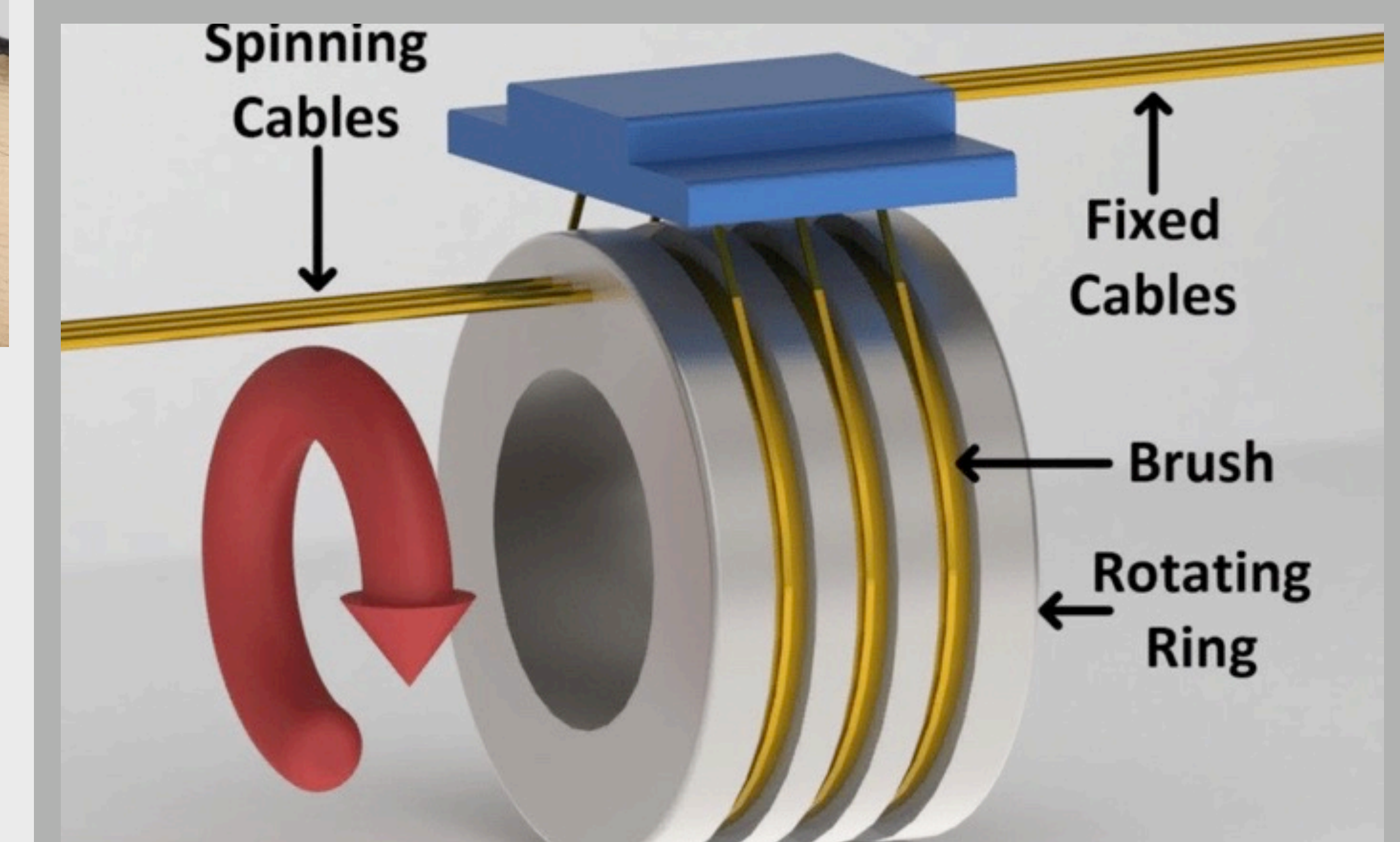
2010, Headset Assembly Schematic [image], European Publication Server, accessed May 5, 2023

CELILO CYCLES

Celilo Cycles was founded by Scott Campbell with the vision to create bicycles that are both beautiful and practical. These bikes are computer engineered and modeled on Creo Software, then shaped out of wood with carbon fiber and Kevlar reinforcements.

WHAT IS A SLIP RING?

A slip ring is an electromechanical device which transmits power from a rotating object to a stationary one.



2021, Schematic Diagram of the Slip Ring [image], Research Gate, accessed May 1, 2023

DESIGN DESCRIPTION

- Bearings: Provides support for the rotating parts of the slip ring and helps to reduce friction.
- Inner Shell: Polyetherimide shell houses the copper rings and provides insulation between the rings.
- Rings: Copper rings are used to transfer electrical signals from the stationary part of the slip ring to the rotating part.
- Outer Shell: Polyetherimide shell provides structural support for the slip ring and protects the internal components from potential damage.
- Brushes: Ball detents are used to maintain contact between the copper rings and the stationary component of the slip ring. Ball detents are commonly used as brush contacts in slip-ring designs.