Pressure Sensor

Too forwards | Good | Too backwards

LED

Posture Monitor

Sensor device:
Sensors attached to chair back that detects pressure in multiple spots.

Display device:
A desk gauge that shows a "posture score" (good → poor) with the needle, plus an LED warning when you've been slouching too long and a button to calibrate "neutral".

Technical details

- ESP32 sending posture metrics over BLE

- Sensor device runs on a small LiPo.

- Processing is lightweight DSP/ML (filtering/smoothing).

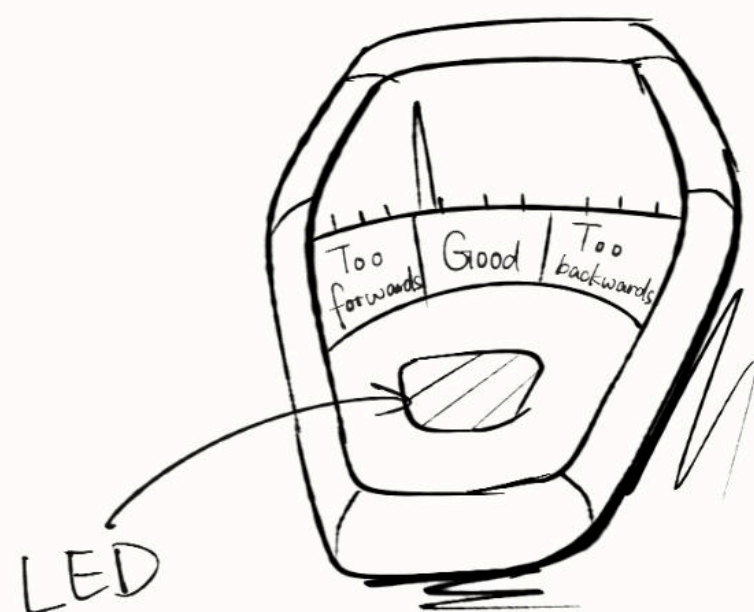- Custom PCB on the sensor device for compactness.

Enclosure design

Sensor enclosure:
Slim curved fabric material that can be clipped on the back of a chair.

Display enclosure:
Tabletop pod with a clean faceplate, one button on the side, LED as a small indicator window.

Filament Indicator

Sensor device:
An IR module mounted on the printer's filament to detect left filament thickness over time.
Display device:
A gauge that shows estimated grams remaining; LED indicates low filament, button resets/sets starting spool weight.

Technical details
- Sensor uses ESP32 and transmits distance data wirelessly, USB-powered from the printer.

- While the display is battery-powered.

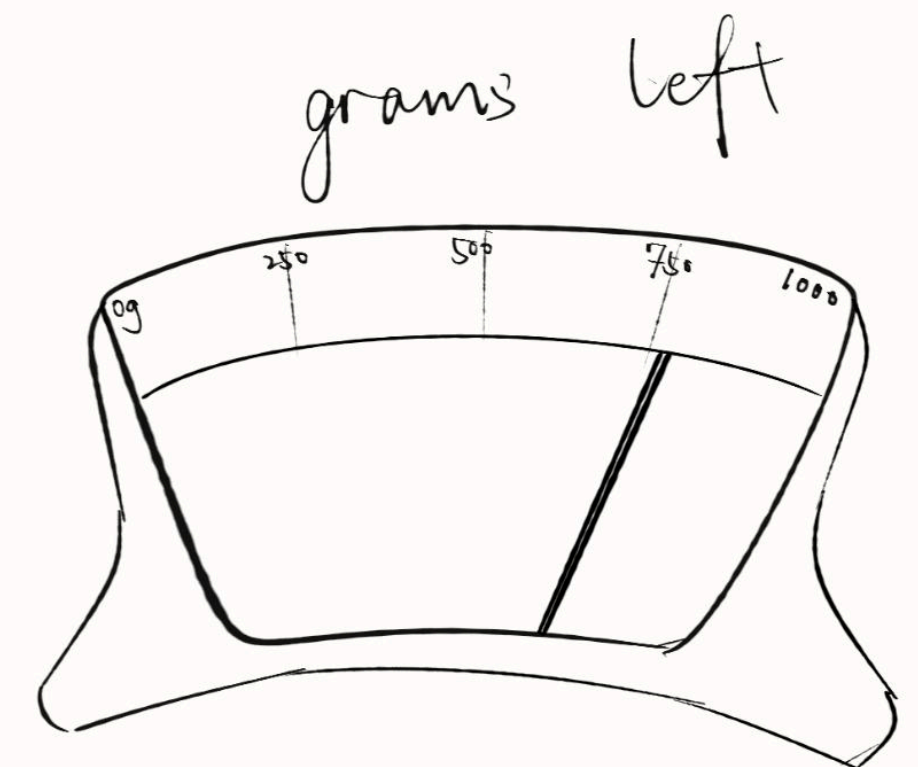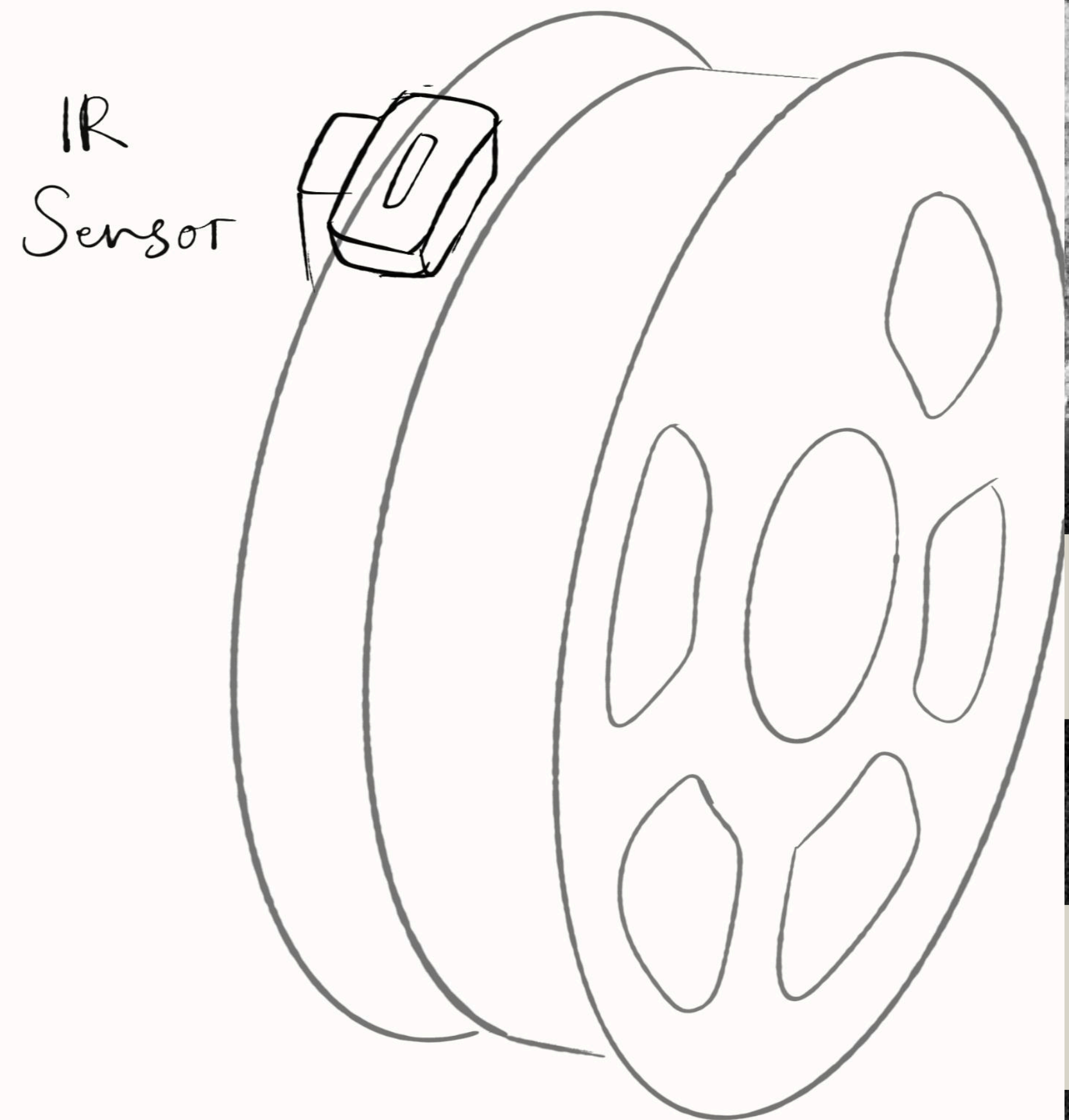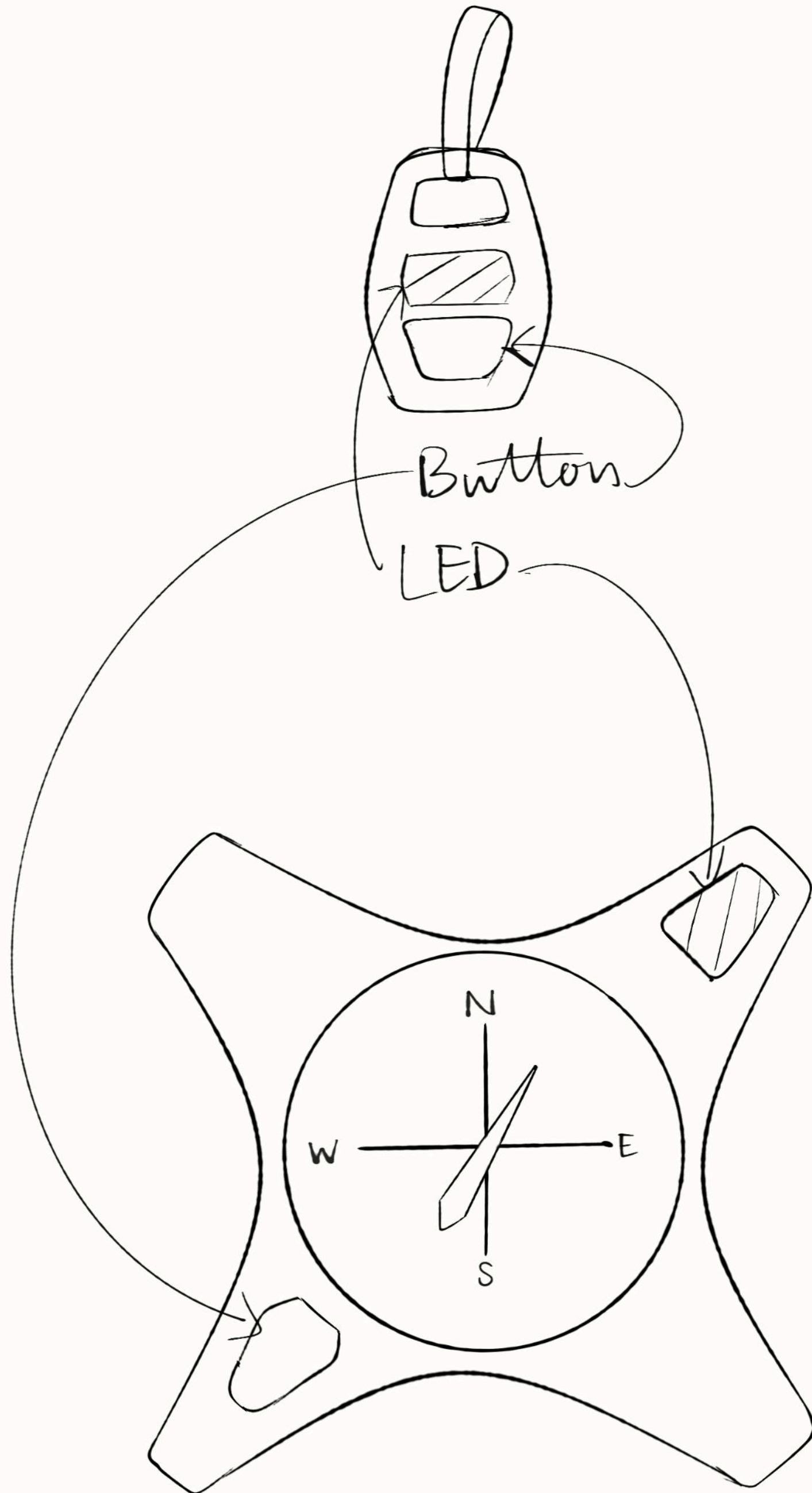- Processing is conversion to grams (DSP-style smoothing).

Enclosure design

Sensor enclosure:
Tiny clip-on module that snaps around a filament guide, or a small bracket that uses existing printer screw holes.
Display enclosure:
"Fuel gauge" style pod that sits next to the printer; face markings in grams with a reset button.

Lab Personnel Locator

Sensor device:
Multiple small wearable tags broadcasting position; optionally a button on each tag for availability.
Display device:
A desk locator gauge where the needle points to one of four labelled positions l; LED shows availability, button cycles target person.

Technical details

- Tags use BLE advertising on coin cell or small LiPo.

- DSP/ML filtering + and simple classification to reduce flicker

- Custom PCB on the display.

Enclosure design

Sensor enclosure:
Small badge-style tag, one tiny LED.
Display enclosure:
Tabletop dashboard gauge with a clean faceplate, one button on the side, LED as a small indicator window.