Frank Deckert

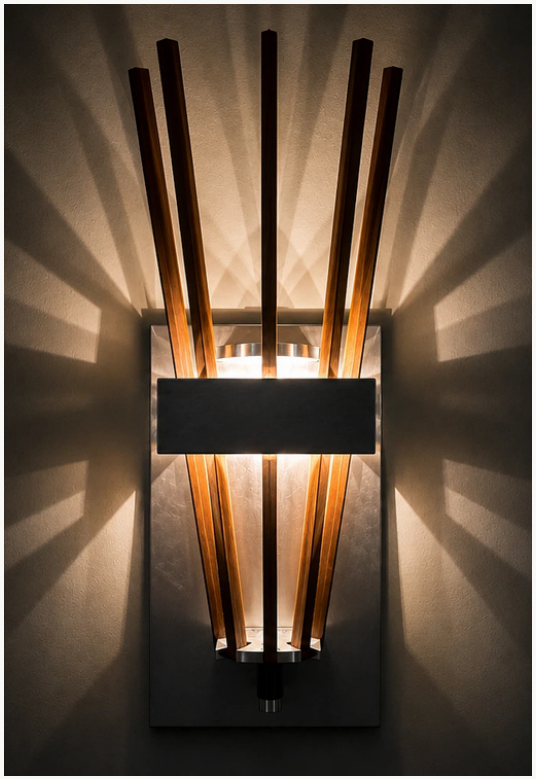
Product Development Engineer & Designer

Physical products from early concept through prototyping, testing, and manufacturable design.
Elegant mechanisms. Practical fabrication. Clear engineering documentation.



ALMA

Commercial product development



Hanger Lamp

Mechanisms, iteration & pilot production



Smart KAFO

Domain expertise & system integration

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01 / ALMA / PRODUCT DEVELOPMENT

A shared mechanism. A family of chairs.



THE DESIGN CHALLENGE

Stable upright.
Natural, intentional recline.

Give a dining chair a stable upright feel and a smooth recline without a lever or active control. The result became the mechanical foundation for a modular chair family.

MY CONTRIBUTION

Designed the torsion-spring counterbalance, guide and motion-control brackets, and adjustable spring preloader. Carried my components through CAD, functional prototypes, supplier communication, first-article inspection, and testing.

Team context: Product Development Engineer at Current Products Corp., working within a small team led by the company owner’s product vision.

7	3	3
BASE OPTIONS	ARM STYLES	BACK HEIGHTS

01 / ALMA / ENGINEERING EVIDENCE

From mechanism behavior to manufacturing.



Assembled chair behavior, shown in the finished product.

GUIDE + BALANCE

Four rollers travel through engineered guide slots. Torsion-spring torque ramps through recline, and adjustable preload tunes the starting condition for different users.

BUILD + TEST

Supplier samples and marked-up drawings supported dimensional, finish, and functional checks. I also built in-house fixtures to expose weaknesses before external testing.

IN-HOUSE PREVALIDATION



PURPOSE-BUILT REPEATED-LOAD PRETEST RIG



MEASURED STATIC-LOAD PRETEST

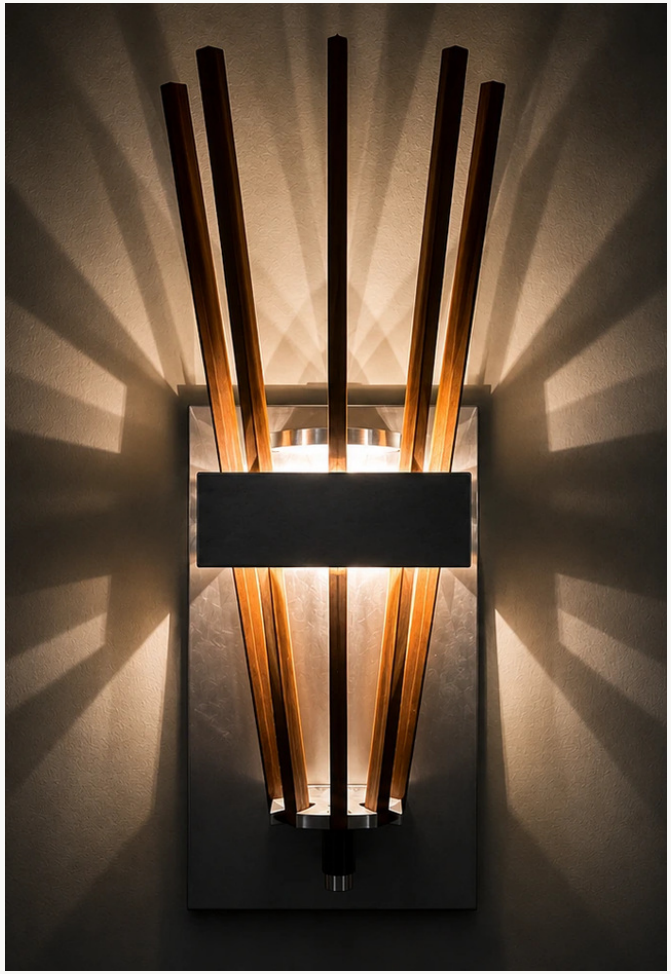
VALIDATION SCOPE

ALMA 100: Component development and supplier / first-article ownership.

ALMA 200: I led third-party validation, with a limited component-development role. Its ANSI/BIFMA X5.4-2020 report lists 16 conforming test-result entries.

02 / HANGER LAMP / PRODUCT INVENTION

Light, hanger, and drying rack.



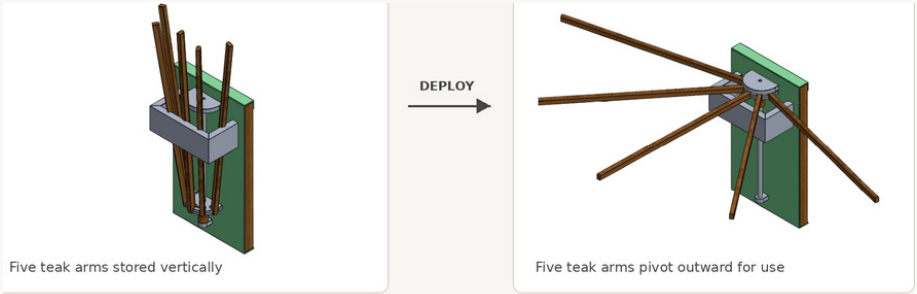
THE DESIGN INTENT

A sculptural wall light that transforms into a useful hanger and drying rack for spaces where every object needs to earn its place.

MY CONTRIBUTION

Mechanical engineering across slider and handle development, CAD, physical iteration, assembly refinement, hinge-pin process tooling, and engineering documentation.

Team: Three-person collaboration with a designer/carpenter and the software engineer who originated the core concept.



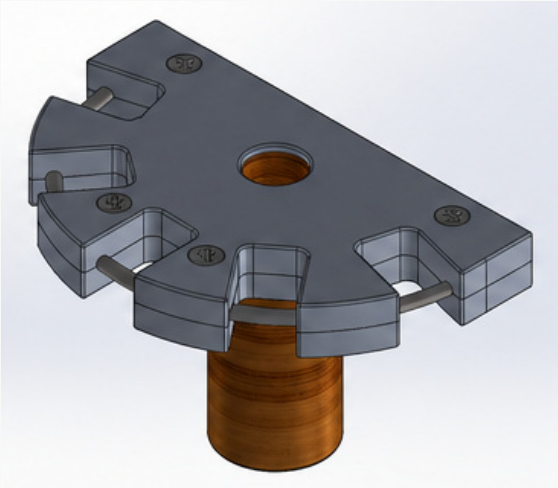
Closed light configuration

Arms deployed for use

20 pilot units / **17** beta sites / Approximately one year of development

02 / HANGER LAMP / DETAIL + PROCESS

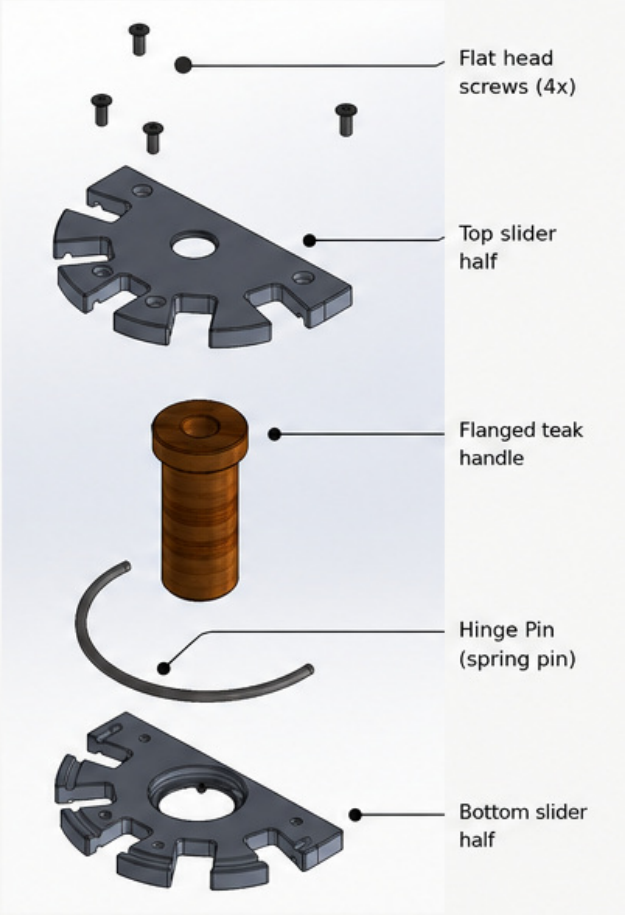
Captured by design. Engineered to move.



Assembled slider and captured teak handle.



Hinge-pin forming fixture.



Exploded slider: the handle flange is captured between two halves.

ACTUATE

The teak handle provides an obvious grip for opening and closing.

CAPTURE

The flange is retained between the slider halves without separate handle hardware.

GUIDE

Teak forms the sole sliding interface against the vertical guide, avoiding metal-on-metal contact.

DESIGN THE PROCESS

I designed a forming fixture for 3 mm stainless-steel hinge pins. A depth stop controls insertion length; deliberate overbend accounts for springback. The process complements the CAD, drawings, BOM, and assembly documentation.

03 / SMART KAFO / MECHATRONICS

Proven mechanics. A targeted intervention.



THE DESIGN CHALLENGE

Preserve stance stability.
Allow knee flexion during swing.

Drawing on my orthotic and prosthetic fabrication background, I initiated a system that adds sensing and automatic release to conventional knee-ankle-foot orthosis hardware.

MY CONTRIBUTION

Concept originator, team lead, and domain expert. I performed all prototype metal fabrication, developed the custom PCB fabrication process and printed tooling, collaborated on system integration, and led the final presentation.

Collaboration: A computer-engineering teammate led circuit design and most programming.

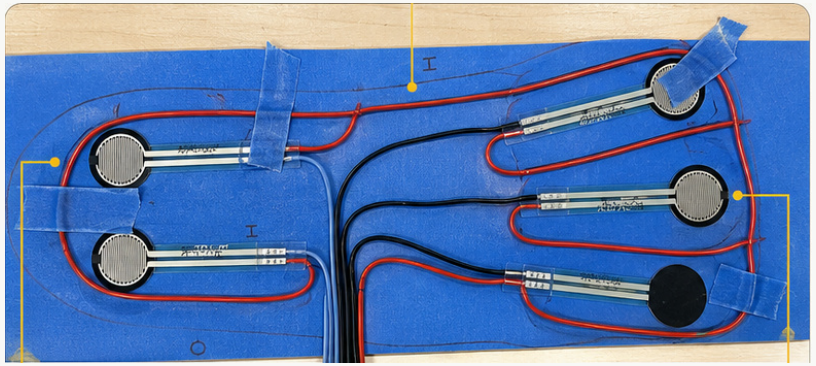
Demonstrated outcome
A wearable walking prototype combining five force sensors, custom electronics, and two compact knee-lock actuators.

03 / SMART KAFO / BUILD + PROOF

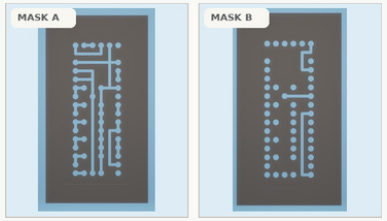
From fabrication to a working prototype.



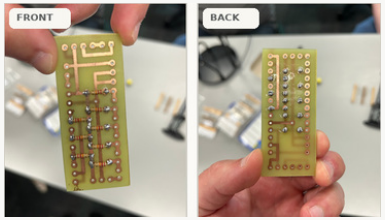
Still from the working prototype’s walking demonstration.



Five sensors: two at the heel and three at the forefoot.



PCB process tooling



Completed custom board

ORTHOTIC FABRICATION

I performed the prototype metal fabrication, bringing hands-on orthotic experience to the wearable build.

SENSOR INTEGRATION

Five force sensors were incorporated into a laminated foot orthotic, with physical testing during development.

PCB PROCESS

I developed the masking stencils, drill gauge, and board-fabrication process to make the team’s custom circuit physical.

TEAM DELIVERY

A computer-engineering teammate led circuit design and most programming. I led the team and final project presentation.

04 / SUPPORTING WORK

The same curiosity, in different contexts.



Mobility-Aid Light

WORKING PROTOTYPE

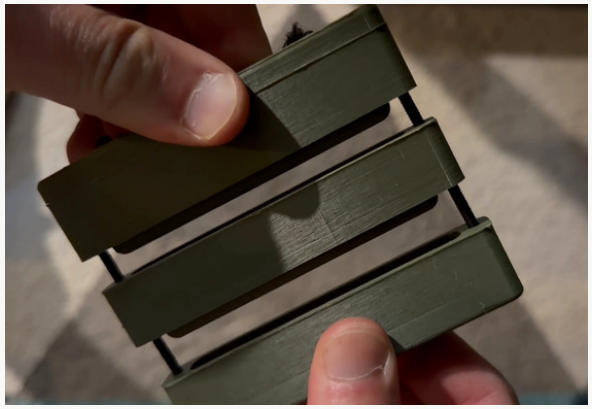
Dark + movement = light. I lead housing and product design; my partner leads circuit design.



Time-Lapse Assistant

TWO-WEEK PROTOTYPE

A working motorized platform with controls for rotation amount, duration, and direction.



Elastic-Hinged Case

PHYSICAL PROTOTYPE

Bungee cord and rigid geometry combine assembly, hinge motion, retention, and closure.



Engineer by training. Maker by habit.

O&P fabrication, a B.S. in Engineering Technology, and hands-on product development shape how I design, build, and test.

LET'S TALK

NEED SOME HELP WITH A PROJECT?

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