GARDEN RIDDLE

Designed for joint pain user Gardening easier with garden riddle.

JENNY KIM DESIGN PRINCIPLES I



Contents





Garden Sieve

is a tool typically used for sifting soil or compost to remove rocks, roots, and debris.

Design Brief



This project aims to redesign a garden sieve that is **ergonomic**, **efficient**, **and durable**, for gardeners with limited grip strength, or mobility challenges. Traditional sieves often demand excessive effort and repetitive motions, causing discomfort and strain. By prioritizing **ease of use**, **durability**, **and accessibility** this design will enable gardeners of all abilities to work with less effort and greater enjoyment.







:0:

Worrying about losing the ability to care for his garden independently.

Hoping to find tools that allow him to keep gardening despite his limitations.

Contemplating how to adapt his garden to be more accessible for his physical needs.



The beauty of his well-tended garden.

Limited mobility causing overgrown or untended patches in his garden.

Advertisements or articles about ergonomic gardening tools and solutions.

Empathy Exercise



The beauty of his well-tended garden.

Limited mobility causing overgrown or untended patches in his garden.

Advertisements or articles about ergonomic gardening tools and solutions.



"Even if it takes me longer, I'll keep at it—I can't imagine life without gardening."

"Experimenting with tools that claim to be arthritis-friendly."

"Taking more frequent breaks to rest his hands and hips."



Empathize

• Understanding the user's perspective.



User Persona



William Parker (70)

Hand impact: struggles with gripping tools and pulling weeds due to finger joint pain. (arthritis)

Mobility impact: issues in his hips, ability to bend and stoop in the garden.





Bio

William has been working as a professional gardner in Providence for over 20 years. Recently, he has started facing mobility challenges due to hip issues, which affect his ability to perform tasks that require bending and stooping while gardening. Since his deteriorate physical health, he often goes to the hospitals to chekup his statement.

Routine

He starts his day with breakfast and spends some time in the garden, focusing on tasks like watering and pruning. He takes his time, incorporating breaks to rest and enjoy the process. In the afternoon, he dedicates a few more hours to gardening. His evenings are usually spent unwinding, with occasional check-ups or monitoring for his health.

Needs

- Lightweight gardening tools
- Ergonomically designed tools
- Tools with clear instructions
- Automated assistance

Scenario

William, a lifelong gardener, is now facing difficulties due to finger joint pain. Tasks like gripping tools and pulling weeds, once easy, have become painful and challenging. He has to take frequent breaks, slowing down his work. William is searching for tools with better grip and ergonomic designs to help him continue gardening without further harming his health.





Frame	 1
Mesh	
Skirt	

GARDEN RIDDLE

is a tool typically used for sifting soil or compost to remove rocks, roots, and debris.

FUNCTION:

Soil sifting: removing debris like rocks, roots and large clumps. Ease of use: soil is shaken with back-and-forth or side-to-side movements. Durability: need to withstand weather and rough handling.

MATERIALS:

Handles: plastic or metal Mesh: plastic or metal Frame: plastic, metal, or wood

CUSTOMER:

Target customer: amateur or professional gardeners User needs: ergonomic riddles without causing strain on their hands and arms Customer pain points: heavyweight, grip issues, and lack of adaptability

COST: \$10 - 100

SAFETY: Structural stability: constructed without breaking or bending Handle and grip: reduce slippage and blisters Weight considerations: light and balanced weight distribution

AESTHETICS: Design and visual appeal: function > aesthetic Material options: wood, metal or plastic Branding and style: design choices can attract customers



Define

• Narrowing down broad insights into a precise user need.

Tool Research

Brand	Terr A . Garden	vegő gardeň	Etsy	(BOSMERE)
Price	\$ 37.99	\$ 39.95	\$ 44.25	\$ 30.95
Product				
Details	two interchangeable screens -0.24" and 0.47" hole size 5 in x 13.8 in x 5 in	removable screen for easy cleaning and flexibility and ergonomically designed. 14.5 in x 14.5 in x 3.3 in	3/8" across. a stainless steel grate that is more durable than the mesh used in sifters 15" x 17" x 3.5H	Strong sieve made from green powder coated steel; with 1/4" mesh. 14.25" in diameter x 3" deep
Review	****	****	****	****

Market Research

"Problems" with the current garden sieve design

















Low-fidelity model & sketches





LEONARDO DA VINCI 1400

Leonardo's anatomical studies emphasized Leonardo s anatomical studies emphasized the importance of understanding the body's mechanics. By analyzing how joints, muscles, and bones work together, we can design tools that complement the body's natural movements.

BIOMECHANICS = biology + anatomy

Biomechanics is the scientific study of the structure, function and motion of the mechanical aspects of biological systems, living organisms at any scale.

Neutral Posture

Neutral postures are postures where the body is aligned and balanced while either sitting or standing, placing minimal stress on the body and keeping joints aligned. You're able to minimize the stress on surrounding muscles and supporting structures of the joint. This reduces fatigue and enhances your body's ability to recover from the workload.

Why important?

A neutral posture minimizes strain on the muscles surrounding your spine, ultimately reducing the chances of injury from twisting and compression of the spine with poor posture.



Biomechanics Research





Prototype 1



Prototype 2





Prototype 5



Prototype 3



Garlan Brosnolon

"Prototype 5 has a good hand grip that feels like handprints. It is natural and organic to hold the sieve. Prototype 1 is the most comfortable and secure." (wrapping around)

Frank

"Both prototypes 1 and 5 have a good size of mesh. Compared to prototype 1, 5 handle is a little bit uncomfortable because of bumps."





Evaluate

• Ensures the design works as intended by testing it with real users.



Wanda Miglus

"It would be easier to follow if there was a rail under the sieve. But, even without a rail, the sieve is lighter to hold and sift." (It might not affect people's strain).



Pascal Holler

"Combining prototype 1 of handles and 5 of the frame would be more ergonomic and efficient to sift. Both sizes are easy to control."

Benny Luo

"Both sieves are well-made ergonomically. But prototype 1 is easier and lighter to control and visually more aesthetic."





Carolina Chen

"I love how it is ergonomic and so lightweight, which is considered for your users. Design-wise, I believe the prototype has potential. One more thing I would like to say is that the side wall does not necessarily need to be rectangular in shape, instead, it would match your concept if that is rounded."









Prototype 1



Prototype 5

Final Model Specification





Prototype 5

+

attachable container



Green Sieve V



Characteristics:

- Made of regenerative materials.

Materials: Clear 1/8" Mesh: Baltic birch plywood 1/8" Handles: Balsa wood block **Colors**:



- Have ergonomic handles to reduce strain on hands and wrists. - Interchangeable mesh screens (6mm, 4mm) - Lightweight frame but durable construction.

Frame & container: Baltic birch plywood 1/8", Acrylic plexiglass









Before

After

Packaging Design



Front

"Garden with Ease, Designed for All"

Green Sieve

Back

Specification: Type: rectangular sieve Materials: wood & acrylic Features: seed sifting siew Dimension:14.5 x 6.3 x 9° Color: natural wood Quantity: 1 piece



Sequential Use:

1. Digang up the lost with a spoort



read)













JENNY KIM DESIGN PRINCIPLES I

Thank you