Kettle Design Proposal

an ergonomic redesign

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About

KETTLE'S ERGONOMIC PROBLEM

Kettles often exhibit several ergonomic problems that can impact user comfort and usability. Common issues include poorly designed handles that are uncomfortable to grip, leading to hand fatigue and potential slips. The weight distribution may be uneven, causing strain on the wrist and making pouring challenging. Inadequate spout design can result in unpredictable pouring, leading to splashing or dribbling. Insufficient consideration of anthropometry can result in handles that are too small or too large for comfortable use by various hand sizes. These ergonomic problems highlight the need for thoughtful design iterations to enhance the kettle's user experience.

FINDING AN ERGONOMIC SOLUTION

Finding an ergonomic solution for kettles requires careful consideration of user needs and preferences. We should prioritize the development of a comfortable and well-balanced handle that accommodates various hand sizes, reducing fatigue and promoting a secure grip. Attention should be given to the weight distribution, ensuring the kettle is easy to lift and pour without straining the wrist. A well-designed pouring spout that facilitates controlled and precise pouring, while minimizing splashing, is essential.
By addressing these ergonomic factors, a kettle can provide a user-friendly and enjoyable experience.

Kettle Anatomy

1. Handle Redesign: Experiment with different handle shapes and sizes to find the optimal grip for users of all hand sizes. Consider using materials with a soft-touch coating for added comfort.
2. Weight Distribution Adjustment: Fine-tune the kettle's weight distribution to achieve better balance and stability during pouring. This can be achieved by redistributing internal components or using lightweight materials in specific areas.
3. Lid Enhancement: Incorporate a spring-loaded mechanism that automatically opens the lid when the user presses a button or lever, reducing the effort required to open it. Add a locking mechanism to keep the lid securely closed during operation.
4. Spout Redesign: Modify the spout's angle and shape to enhance pouring accuracy and minimize the risk of drips or spills. Test various configurations to find the optimal design.

Research

Dimension	Percentile					
	Right hand			Left hand		
	5th percentile	50th percentile	95th percentile	5th percentile	50th percentile	95th percentile
Hand length	178.33	192.50	206.66	179.13	192.98	207.71
Palm length	99.07	110.68	119.87	99.31	110.89	121.11
Hand breadth at thumb	91.60	102.54	112.82	91.79	101.95	112.05
Hand breadth at metacarpal	79.44	87.05	96.51	78.55	86.25	95.25
Grip diameter	50.00	65.00	85.00	50.00	65.00	85.00
Fist circumference	245.00	271.00	300.00	241.0	269.00	296.50
Hand circumference	215.00	238.00	261.00	214.00	236.00	260.00
Wrist circumference	146.00	163.00	181.00	146.00	163.00	181.00
Arm length	700.00	755.00	810.00	700.00	755.00	810.00
Elbow length	431.87	468.43	504.11	433.23	466.30	503.78
Elbow flexed	235.00	270.00	311.00	236.00	268.00	310.00
Fingertip to root digit 1	49.03	57.37	70.80	47.57	56.51	70.21
Fingertip to root digit 2	63.35	72.76	79.51	63.01	73.18	80.19
Fingertip to root digit 3	69.17	79.37	87.78	68.73	79.58	87.56
Fingertip to root digit 4	62.20	73.77	81.52	61.66	72.88	80.71
Fingertip to root digit 5	50.58	59.46	67.16	49.51	59.43	65.90
Breadth of first joint of digit 1	18.65	22.08	25.17	18.60	21.50	24.59
Breadth of first joint of digit 2	17.34	20.04	22.68	16.90	19.75	22.39
Breadth of first joint of digit 3	17.26	20.00	22.30	17.00	19.64	22.05
Breadth of first joint of digit 4	16.05	18.68	21.11	15.74	18.38	21.04
Breadth of first joint of digit 5	13.95	16.98	19.24	13.62	16.58	19.41
First joint to root digit 2	39.42	47.34	53.50	38.30	47.07	53.61
First joint to root digit 3	43.10	52.55	60.34	42.56	52.13	59.33
First joint to root digit 4	38.20	46.52	53.82	37.73	46.39	53.35
First joint to root digit 5	27.71	35.12	41.51	27.37	35.20	41.55
Second joint to root digit 1	17.39	23.16	31.01	17.76	22.74	29.97
Second joint to root digit 2	19.40	24.11	27.68	19.29	23.90	28.06
Second joint to root digit 3	21.34	26.35	30.58	20.57	25.86	30.43
Second joint to root digit 4	17.40	22.75	27.18	17.40	22.43	26.84
Second joint to root digit 5	13.59	18.10	21.88	13.71	17.87	21.35

Hand ergonomics play a crucial role in the design of products, including kettles, to ensure user comfort and usability.
The provided percentile values of hand dimensions offer valuable insights into the range of hand sizes that designers should consider. By understanding these dimensions, designers can create kettle handles that accommodate a variety of hand sizes, optimizing grip and reducing fatigue.
The data reveals that hand length, hand breadth, and thumb length vary among individuals, emphasizing the need for adjustable or universally designed handles.
Designers can use these percentile values as a reference to create handle dimensions that cater to the majority of users, promoting a more ergonomic and user-friendly experience when using a kettle.

Research


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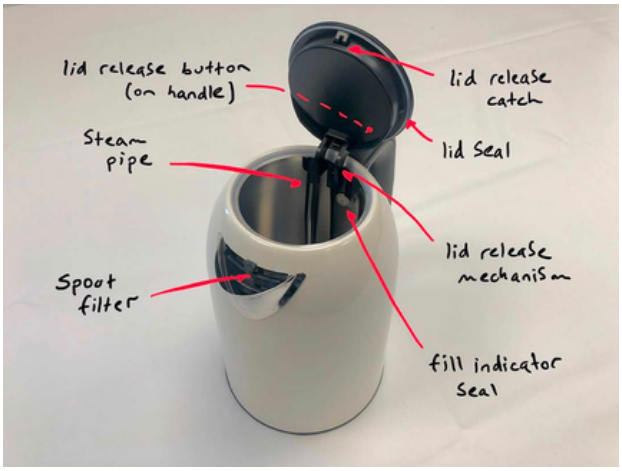
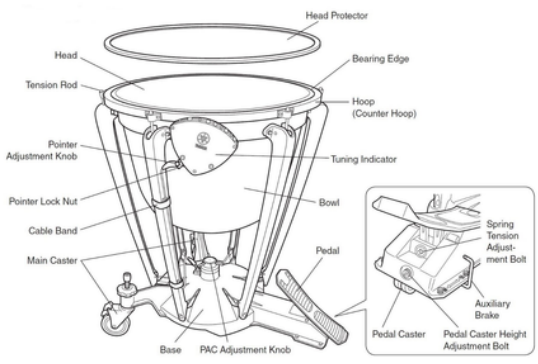
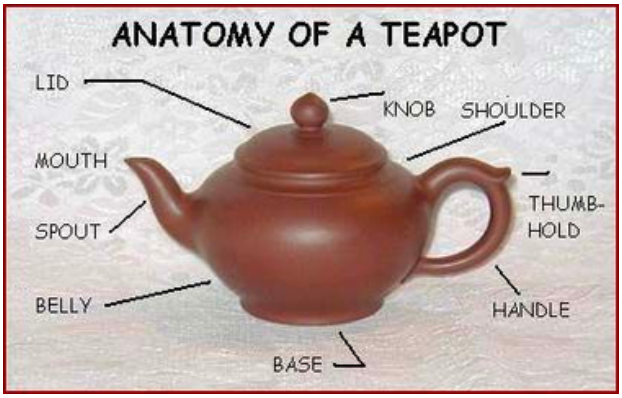
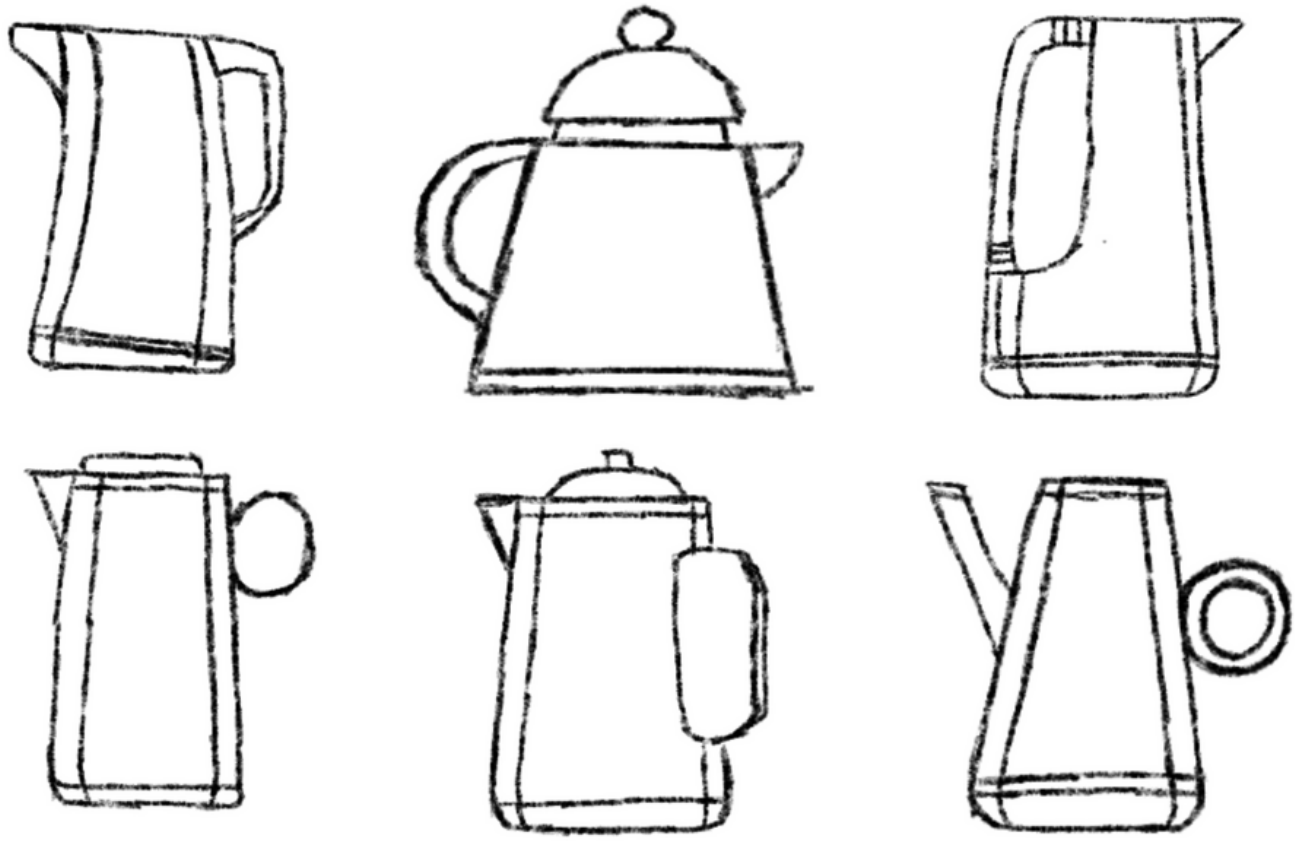
1 liter capacity
stainless steel spout
The Perfect Pour
Features a gooseneck spout for precise pouring. Gives you a slow, controlled pour with mess free pour.


lid release button (on handle)
lid release catch
Steam pipe
lid Seal
lid release mechanism
Spout filter
fill indicator Seal


Head Protector
Head
Bearing Edge
Tension Rod
Hoop (Counter Hoop)
Pointer Adjustment Knob
Tuning Indicator
Pointer Lock Nut
Bowl
Cable Band
Pedal
Main Caster
Spring Tension Adjust-ment Bolt
Auxiliary Brake
Base
PAC Adjustment Knob
Pedal Caster
Pedal Caster Height Adjustment Bolt


ANATOMY OF A TEAPOT
LID
KNOB
SHOULDER
MOUTH
THUMB-HOLD
SPOUT
BELLY
HANDLE
BASE

Kettle Ergonomy



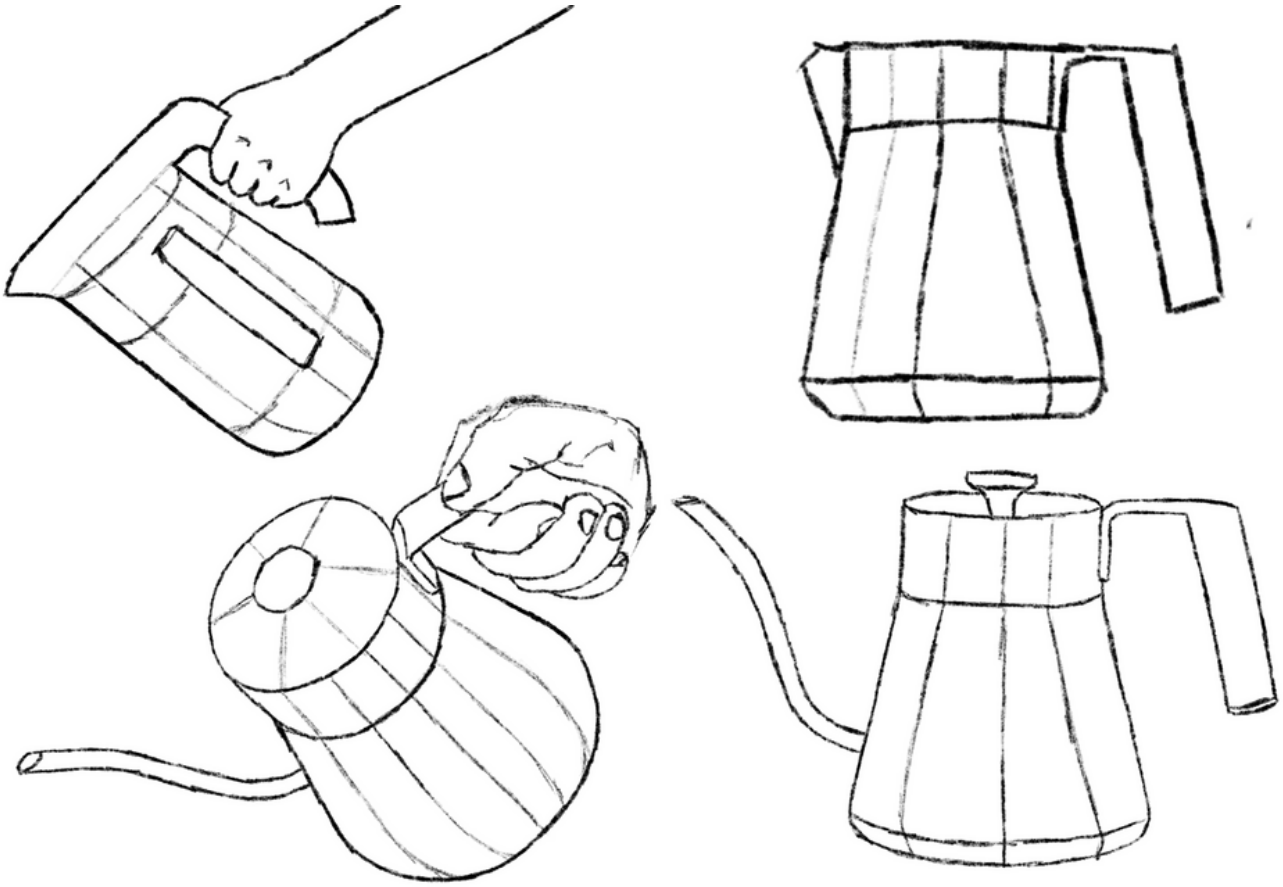
Some classic kettle types with different spouts, handles, body types, bases, lid designs.

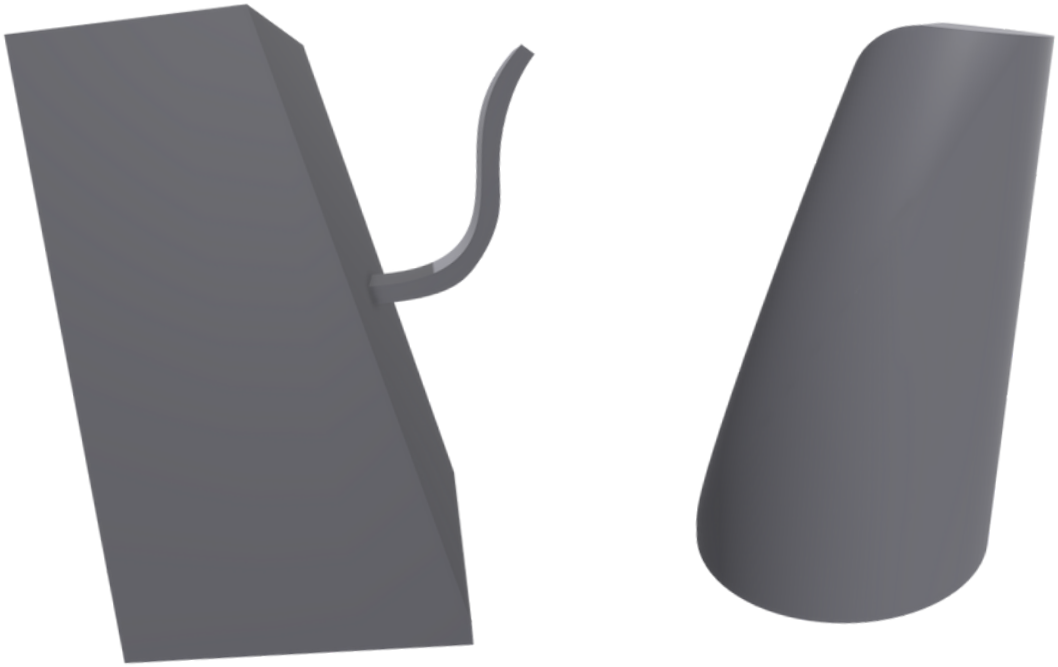
The handle should be ergonomically shaped, allowing for a natural and relaxed grip. It should have a non-slip surface to prevent the kettle from slipping out of the user's hand. The size of the handle should accommodate various hand sizes.

The spout should be designed to deliver a smooth and controlled pour, minimizing the risk of splashing or dripping. The angle and shape of the spout should facilitate precise pouring without the need for excessive tilting.

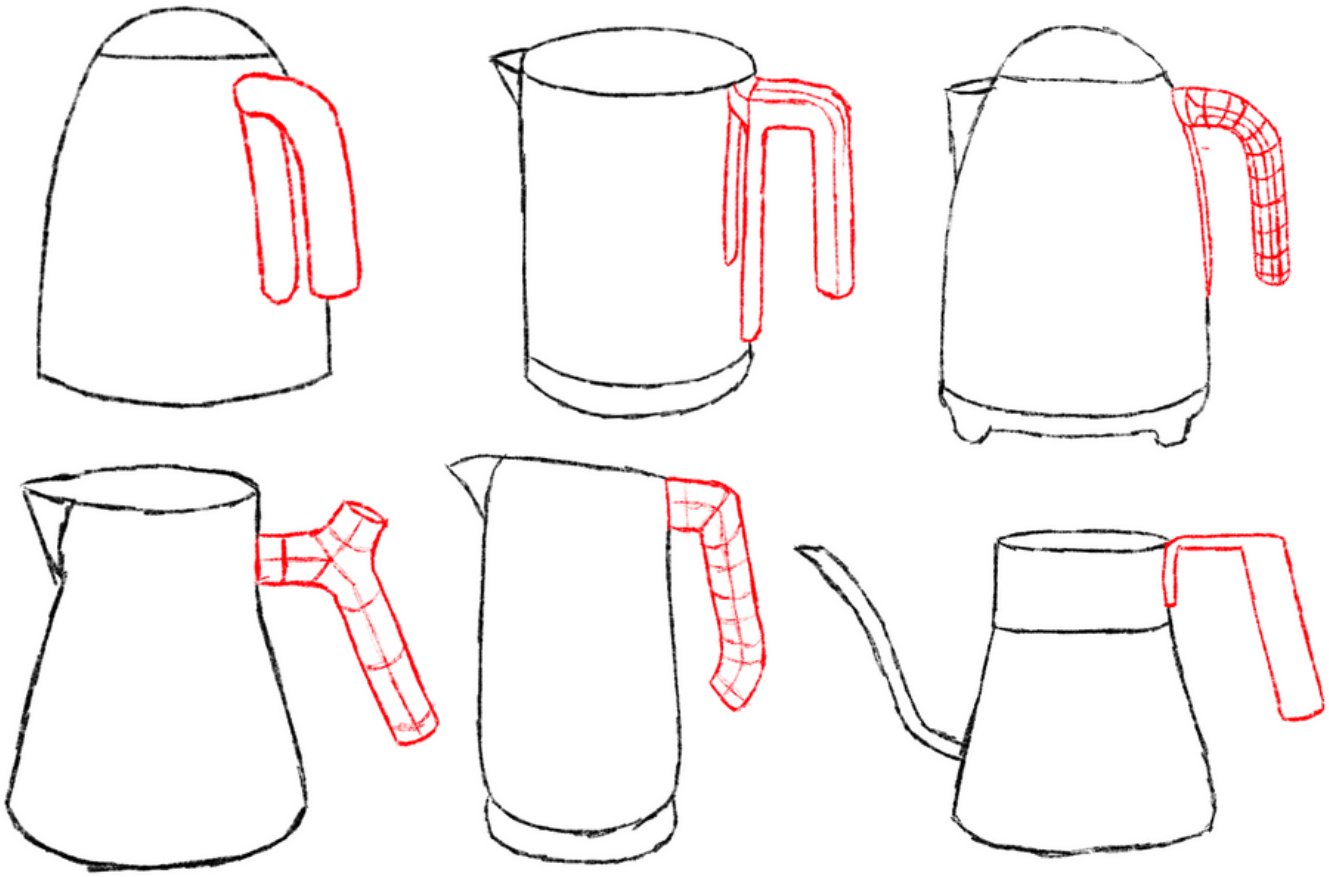
Weight of the kettle should be evenly distributed to prevent strain on the user's wrist or arm during pouring. The center of gravity should be located close to the handle to enhance stability and control.

Initial Ideation



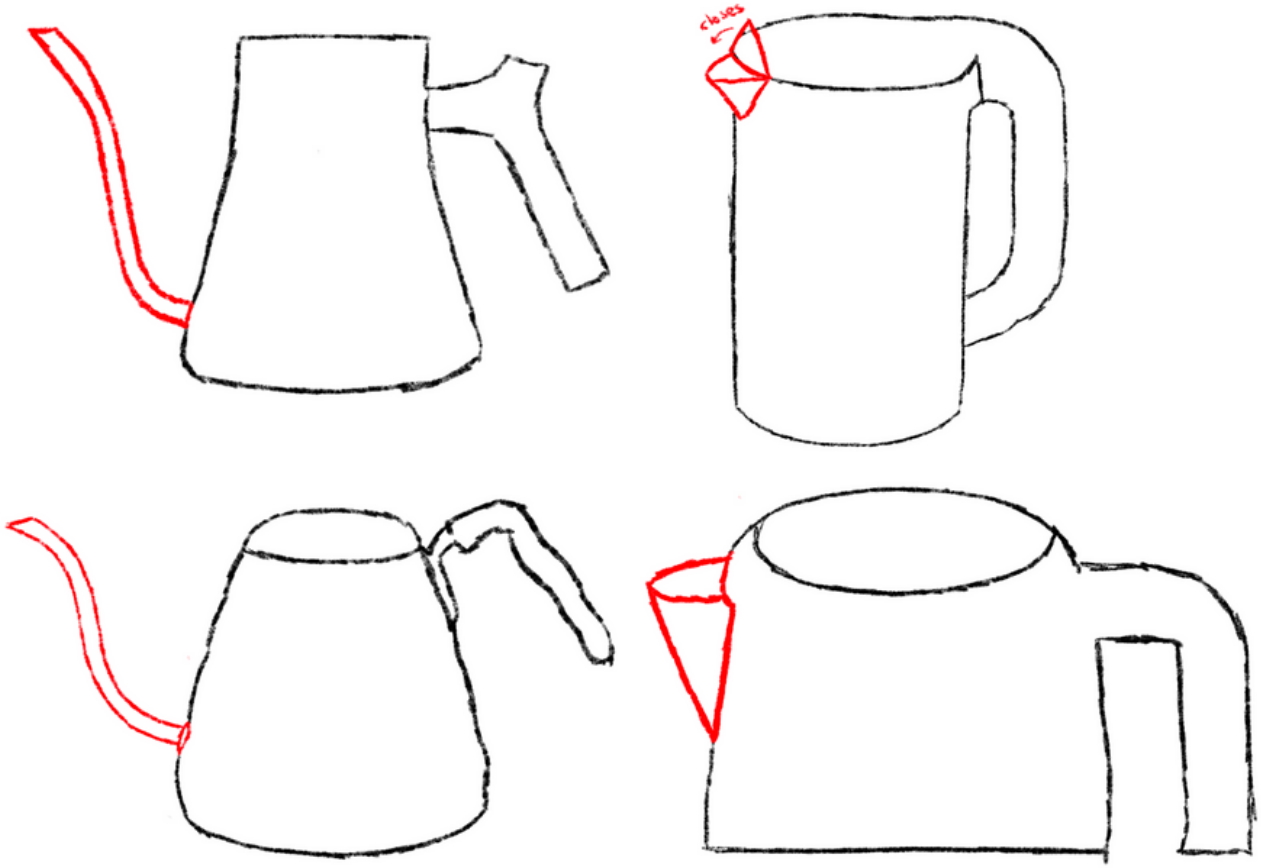


Handle Ergonomy



The kettle should feature an easy-to-grip handle that requires minimal effort to use. In my opinion, the most ergonomic design option would be a kettle with a top-mounted handle positioned at an angle of approximately 160 degrees.
This design allows for a natural and comfortable hand position, reducing strain and fatigue during operation. The handle's placement on the top of the kettle ensures a well-balanced weight distribution and provides enhanced stability while pouring.
By incorporating this ergonomic handle design, the kettle offers a user-friendly experience, prioritizing comfort and ease of use.

Spout Ergonomy



The spout of the kettle should be designed to eliminate any room for error. It is essential for the spout to either have a secure closure when not in use or feature a more angular ("gooseneck") design.
This ensures that when the kettle is being carried from one place to another, the risk of boiling hot water spilling is minimized.
By incorporating a secure closure or an angular spout design, the kettle provides a reliable and safe pouring experience, preventing any accidental spills or potential injuries.
This attention to detail in spout design prioritizes user safety and enhances the overall functionality of the kettle.

Design Proposal

The most ergonomic kettle for solving problems should include the following design elements:

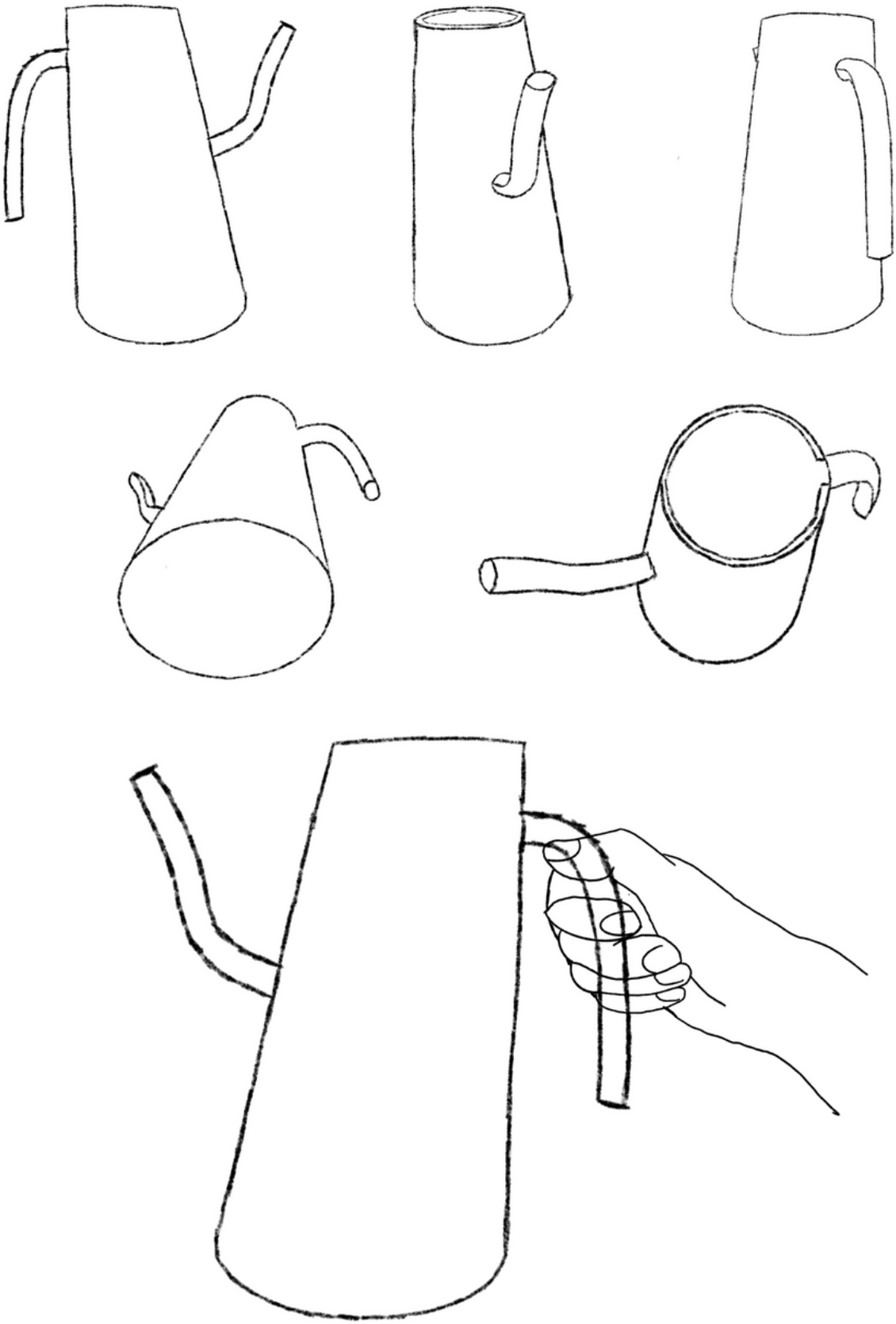
Gooseneck Sprout:

1. Precise Pouring: The gooseneck spout allows for precise control over the flow and direction of the water.
2. Reduced Spillage: The narrow and elongated design of the gooseneck spout minimizes the chances of spilling or splashing hot water, ensuring a cleaner and safer pouring experience.
3. Slow and Steady Flow: The curved shape of the spout slows down the water flow, allowing for a steady and controlled pour, which is particularly beneficial when dealing with delicate beverages or precise measurements.

Top-mounted Handle:

1. Ergonomic Grip: The top-mounted handle design allows for a more natural and ergonomic grip, reducing strain on the wrist and arm during use. It aligns with the natural curvature of the hand, promoting a comfortable and secure hold.
2. Better Weight Distribution: By attaching the handle from the top, the weight of the kettle is distributed more evenly, providing better balance and stability. This makes it easier to lift, pour, and control the kettle, enhancing user control and minimizing the risk of accidents or spills.
3. Reduced Heat Transfer: When the handle is attached from the top, the distance between the user's hand and the hot kettle body is increased. This helps to minimize heat transfer, reducing the risk of burns or discomfort during use.
4. Streamlined Aesthetic: The angular finish at the bottom of the handle adds a visually appealing and modern touch to the kettle's design. It can contribute to an overall sleek and streamlined aesthetic, enhancing the visual appeal of the product.

Final Sketches



Final Models

Product

The kettle features a stainless steel body with a silicone non-slip grip, combining durability, aesthetics, and user comfort. The stainless steel construction ensures longevity and heat resistance, while the silicone grip provides a secure and comfortable hold, preventing any slips or accidents during handling. With this ergonomic design, users can confidently pour boiling water without the worry of spills or splashes. The sprout design further enhances the ergonomic functionality by allowing precise and controlled pouring, minimizing the risk of hot water accidents. This kettle not only prioritizes user safety but also offers a seamless and enjoyable pouring experience. Its combination of materials, non-slip grip, and ergonomic sprout design make it an ideal choice for those seeking a professional and user-friendly kettle.