

ROLL ME BABY

- Reinventing Rolling



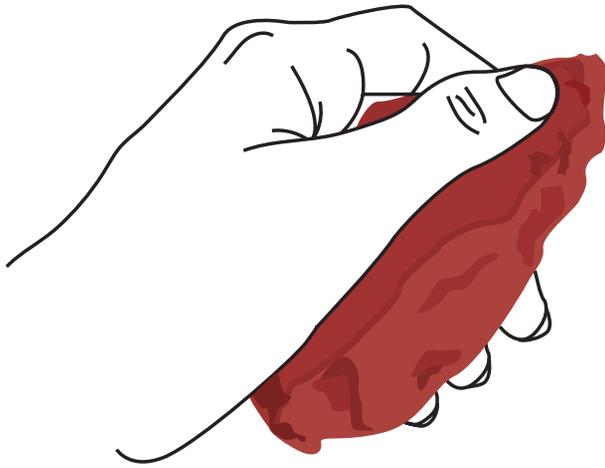
Tarika Jain + Mika Carpenter + Kimaya Malwade

Roll Me Baby is a universal rolling pin that caters to the home and commercial baker. Designed to alleviate strain on the wrist, the dual action roller allows the user to choose between the power and precision grip when necessary.

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A Trip Before the Grip



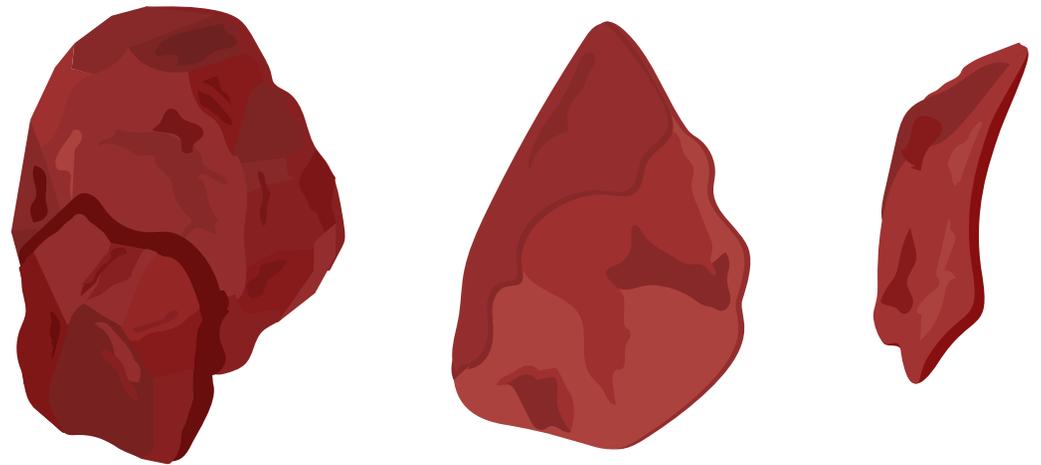
In order to better understand the ergonomics of hand tools we went to the museum of natural history. As a group we understood the history of the hand tools. The very first hand tools were made by cave men and these incorporated universal design as they were used for various tasks such as but not limited to scraping, slicing and cutting. All of these tools had a similar grip which was the power grip.

Although the tool was quite different from our tool - the rolling pin, it was interesting to understand the ergonomics of it and how it was made. The stones were shaped by flaking off small pieces from the main stone and attaining an oval shape.

We could go and feel these samples in our hand at the stand which was helpful in understanding the feel and material of these tools. They felt comfortable to hold due to the bumpy facets created by the flaking process.

The dents in them felt like groves for thumb rest.

Over all, we took back main points directed to our tool, which were that the bulky core of the stone fit snugly into the palms of our hands.



therefore the fingers did not have to clench on to the stone to hold it in place continuously. And secondly it's the angle that your wrist makes that causes pain while working with these types of hand tools, hence minimizing the angle between the fore arm and the hand lowers the pressure on the muscles.

Universal Design Principles

EQUITABLE USE

The design should be safe, private, marketable, useful and appealing to all users equally without any segregation of any user group.

FLEXIBILITY IN USE

The design should accommodate a wide range of methods of use according to individual preferences and abilities with accuracy and precision.

SIMPLE AND INTUITIVE USE

The Design should have an intuitive and simple function communicated through consistent information which does not require any advanced knowledge of a particular language, subject or current concentration level.

PERCEPTIBLE INFORMATION

The design should communicate necessary legible information easily and effectively to the user in pictorial or verbal form while also considering translation for people with disabilities or ambient conditions..

TOLERANCE OF ERROR

The design should minimize hazards and the adverse consequences of accidental or unintended actions through instructions and function.

SIZE AND SPACE FOR APPROACH AND USE

The design should take into consideration the size, space, posture and mobility of a person or a place with respect to the product in use.

LOW PHYSICAL EFFORT

The design should cause no impairment or fatigue and require minimum physical effort for short or long period of time without compromising on the efficiency of function and aesthetics.

Timeline

1739
Top china rolling pins, windmill and sailboat designs by Delft, and blue-and-white Blue Onion motif by Meissen were made long before they became popular.

Before 1810
The earliest Nailsea glass rolling pins were dark green with ribbons or splashes of white.

1800s
J.W. Reed, an African-American inventor, creates a new type of rolling pin that has a central rod. The handles did not spin along with the body; this design is similar to what bakers use today.

After 1810
The base glass was clear with stripes or loops in colors like white, pink, and blue.

1830
The ribbons of color were so close together, the clear glass was obscured. Stoneware and yellow pins
These large, sturdy tools were made of a heavy, coarse yellow pottery.
most scarce antique rolling pins today.

1845
The high tax on salt made this practice very expensive and valuable. These pins were often hung by a fire to keep the salt dry.

1700s
English port towns like began producing hollow glass rolling pins called sailor's charms, which were given as gifts to young women by sailors in hopes of wooing them. They were printed with sailors, ships and phrases such as "be true to me," "for my mother," and "may the eye of the Lord watch over you."

1845
People were becoming more interested in the germ theory of disease, and hygiene. Porcelain and ceramic became the material of choice because they were easier to clean than wood, and could be filled with cold water for to keep dough

1903
Harlowe's "Do Not Stick" rolling pin is developed, which had a separate mesh cylinder for dusting flour.

1912
"A rolling stone gathers no moss. Our new rolling pin gathers no dough."
A particularly coveted non-absorbent glazed stoneware rolling pin, revolving on polished wooden handles is sold by Seastrand catalog.

1912
Metal was used by candy makers, as it chilled unusually well.

Rolling pins often came with a tin pastry sheet, and chilled so well that flour was not needed to keep the dough from sticking to the surface.

Rolling pins with marble barrels and turned wooden handles became collectibles.

Before 1930
Rolling pins with length-wise ridges were used for crushing oats, salt, or bread crumbs. Oats were generally less refined, so the ridges on the pins were very sharp and close set.

After 1930
After that time, the ridges on the pins got flatter and farther apart. Because of this, the ridges can indicate the age of the pin.

1900
Thanks to the turn-of-the-century concept of novelty advertising, ceramic rolling pins were often printed with advertisements for grocery stores, five-and-dimes, banks, and flour mills. "Save Your Dough" was a common pun in these printed slogans

1902
In the United States, the Sears Roebuck catalog offered the first manufactured handled rolling pin with a revolving barrel.

2000s
Emerging American taste for noodles

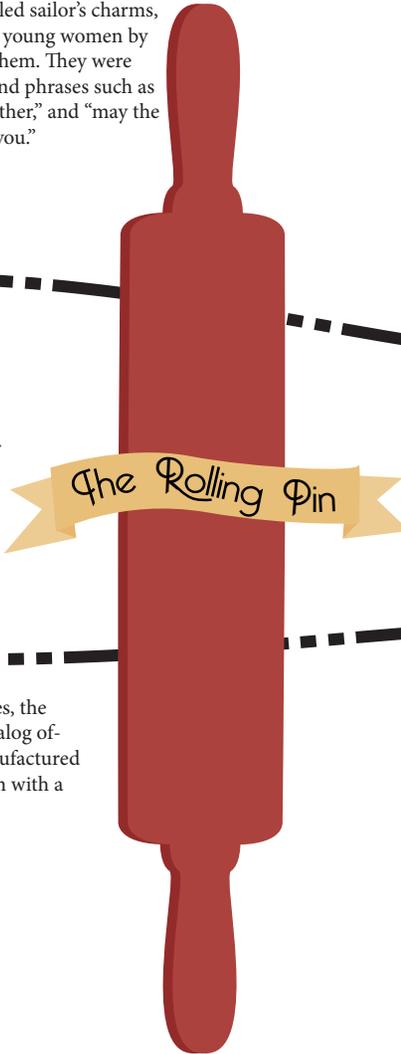
Pie-crust rolling pins were used for homemade pasta

Pins with ridges around the circumference were used for cutting noodles out of dough.

1600s
Maple and Lignum vitae became the most popular wood used to make rolling pins due to their weight and density, which helped them resist moisture, germs, and cracking. Lignum vitae is unusually hard and as dense as iron, so those rolling pins were designed to last a lifetime.

9th century BC
Etruscans create the first known rolling pins, which were homemade wooden cylinders. They lived in what's now Tuscany, western Umbria, and northern Lazio in Italy.

1867
Taylor's Combination Rolling Pin had two rollers, which was asserted to do twice the work in the half the time.



Market Analysis

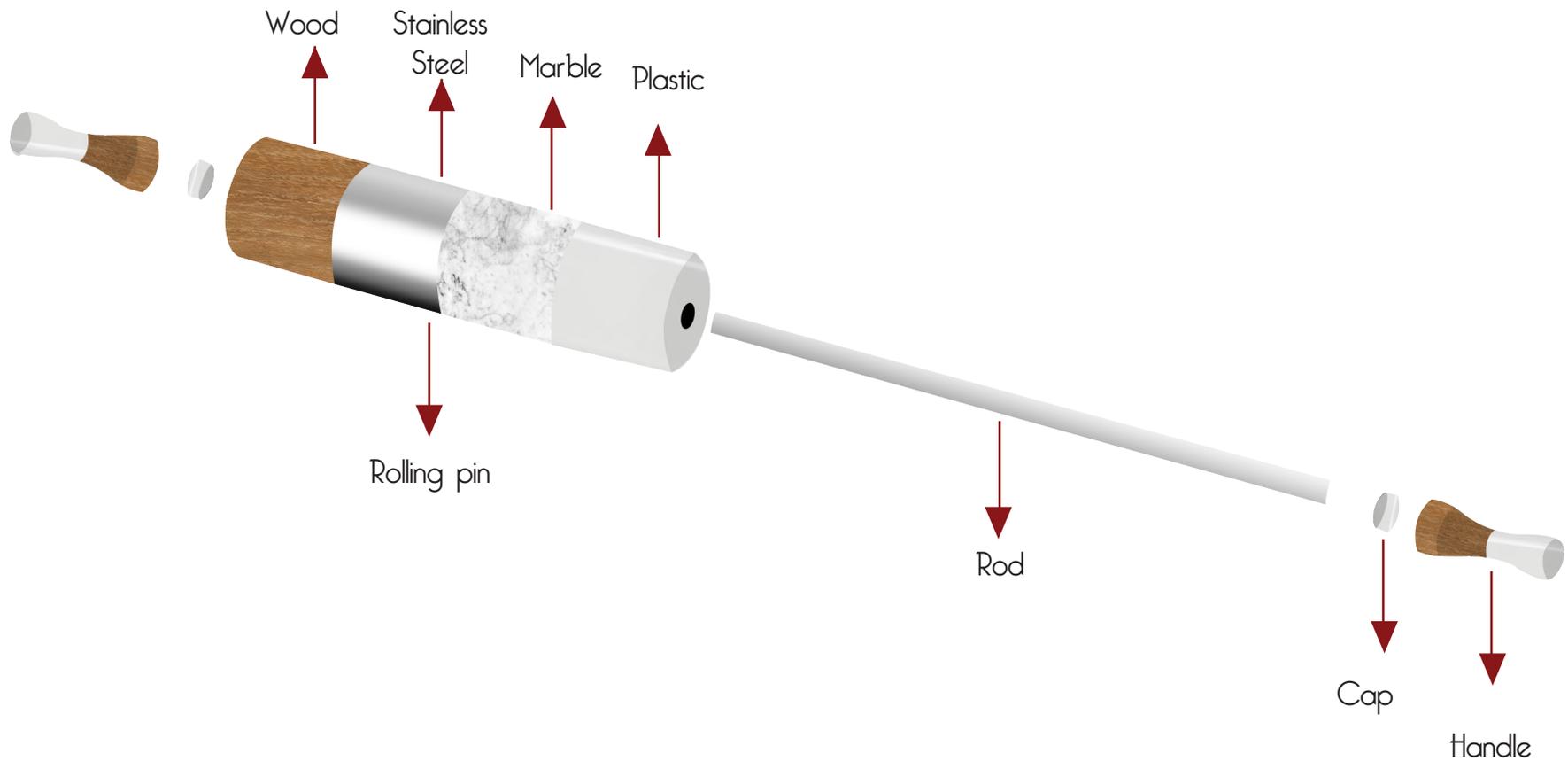


Brand	Fox Run	Ateco	Ateco	Sunbeam	Essential Home
Weight (1-3)	1	1	1	2	2
Manufacturer Location	China	China	China	Taiwan	Taiwan
Retailer	Broadway Panhandler	Broadway Panhandler	Broadway Panhandler	Saifee Hardware	Kmart
Price	Original \$4.00 Sale \$1.40	\$13.56	Original \$5.95 Sale: \$3.95	\$6.99	\$8.69
Material	Wood	Plastic	Wood	Wood	Wood
Packaging	Price Stickers	Wrapped in plastic	Price Stickers	Cardboard shelf hanger	Plastic Wrap
Durability	Low	High	Low	Low	Low
Size	7.5" (4.25")	8"	9.5"(6")	16.5"(9.75")	17.5"(10")
Advantages	Appropriate for rolling small sized dough	Smooth, easy to control, good for levelling, good for fondant	Better control of dough due to small size	Resting point for Index Finger. Barrel supports fluid and fast motion	Elongated handles for adults. Smooth barrel. Handle Holes
Disadvantages	Slim, short handles are hard to grasp	Bad grip because of size and no handles	Only for small sized dough, hard for adult hands to grip	Short Fingers, hard to grasp. Fingers touch counter when rolling	Thick rolling barrel makes it difficult to feel the dough when rolling

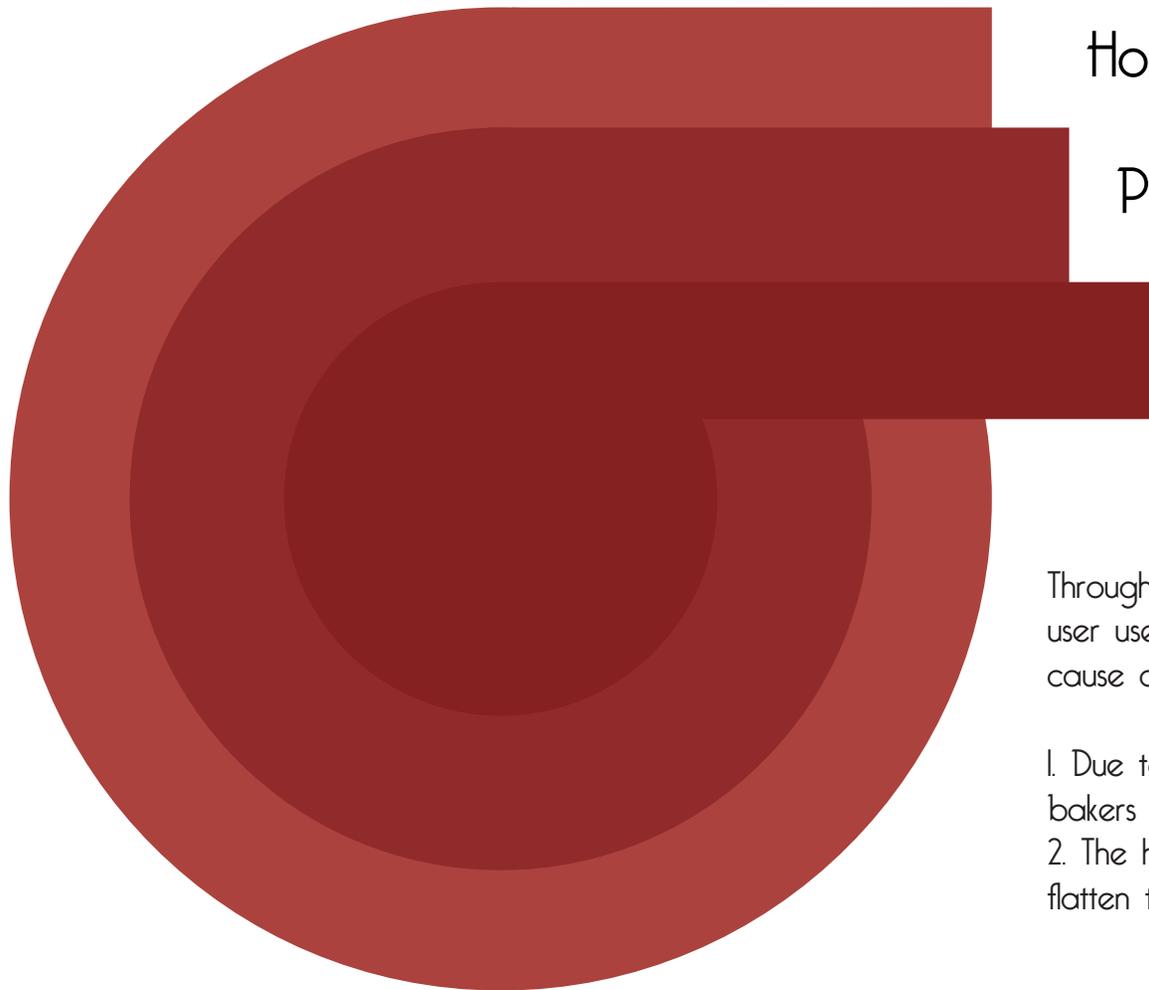


Brand	Essential Home	J.K. Adams	Fox Run	Oxo	Fox Run
Weight (1-3)	3	2	3	3	2
Manufacturer Location	Taiwan	USA	Taiwan	China	China
Retailer	Kmart	Broadway Panhandler	Broadway Panhandler	Basics Plus	Broadway Panhandler
Price	\$11.49	Original \$11.95 Sale \$10.75	\$15.96	\$24.90	\$17.96
Material	Metal & Wood	Wood	Marble	Metal and Plastic	Wood
Packaging	Plastic Wrap	Sits directly on shelf	Cardboard box	Cardboard tag	Price sticker
Durability	Medium	Low	High	High	Low
Size	18"(10")	20.5"	18"(10")	20.75"(12")	21"
Advantages	Teardrop shaped handles fit nicely in the hand. Handle Holes	Good for rolling pizza	Good for stretching dough because of weight	Handles are shaped to fit the hand snugly	Helps maintain uniform thickness of the dough
Disadvantages	Dough sometimes gets stuck under pin and flips over	Lack of handles puts more strain on palms	Lack of control due to heavy weight. can't make dough round	Nonstick coating sometimes causes the dough to flip over	Only appropriate for certain baking needs. no comfortable grip

Exploded view of a normal rolling pin



User Analysis



Home User

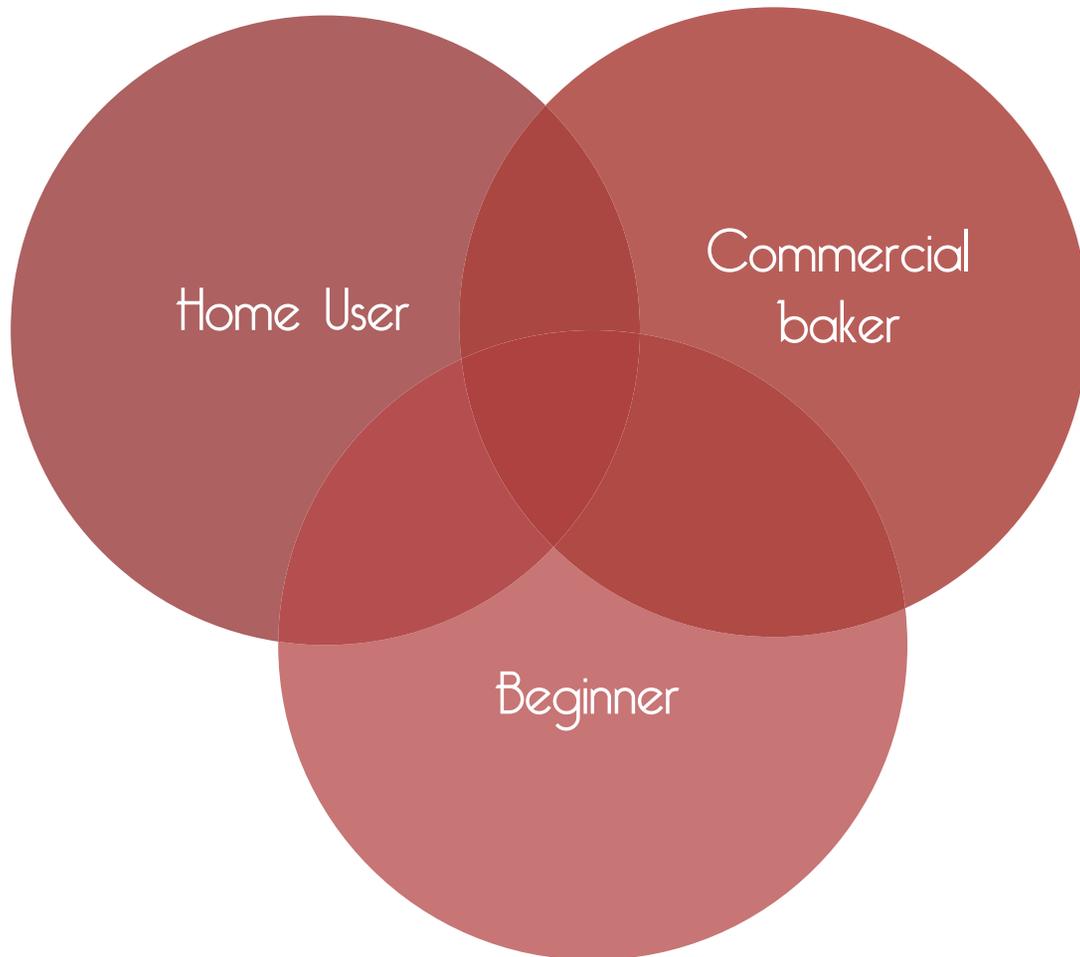
Professional chef/baker

Beginner

Through user analysis we found out that the home user uses the rolling pin the maximum. This is because of two reasons:

1. Due to more population of home users than bakers and beginners
2. The home user mainly has only a rolling pin to flatten the dough.

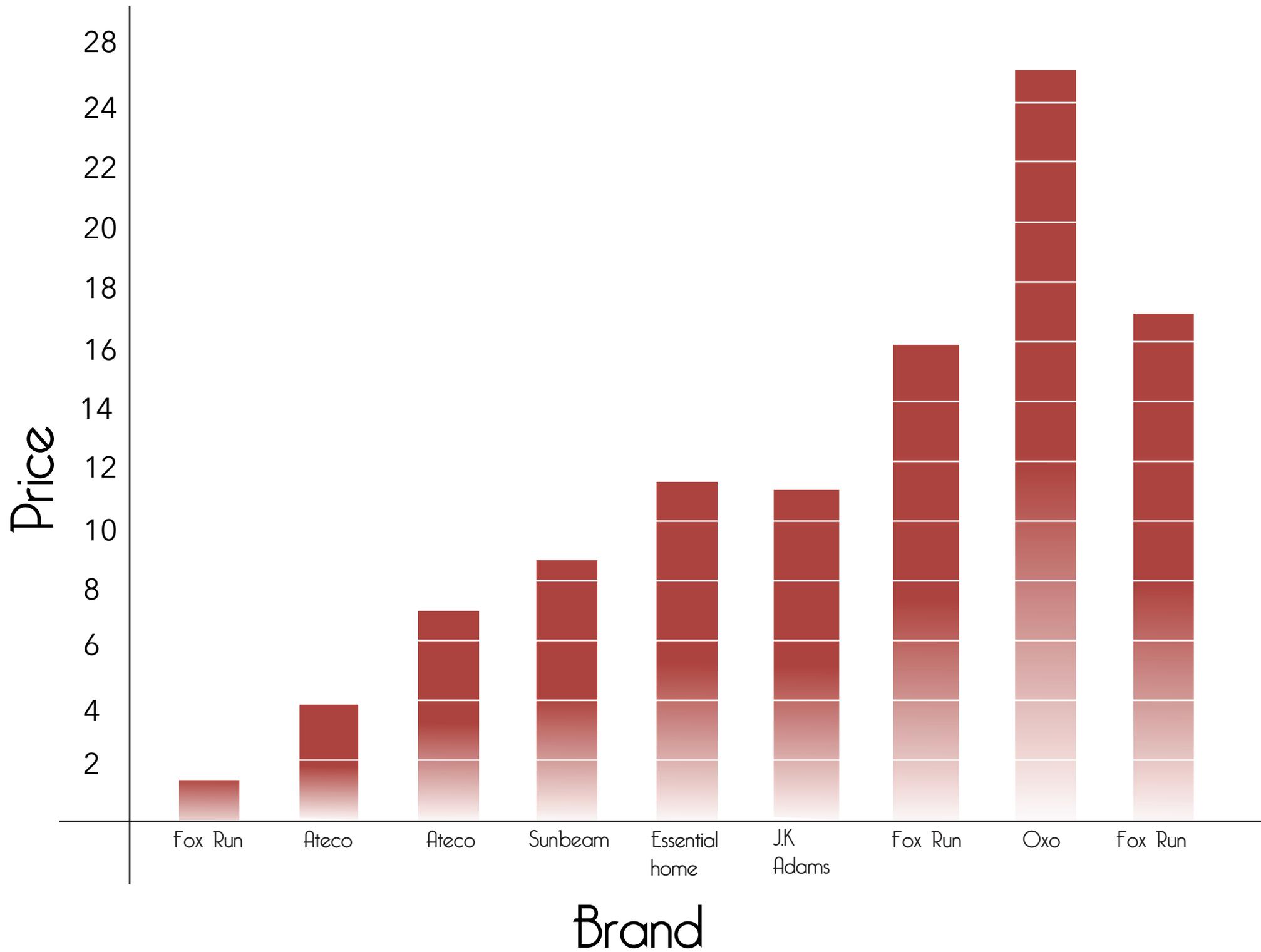
User Analysis

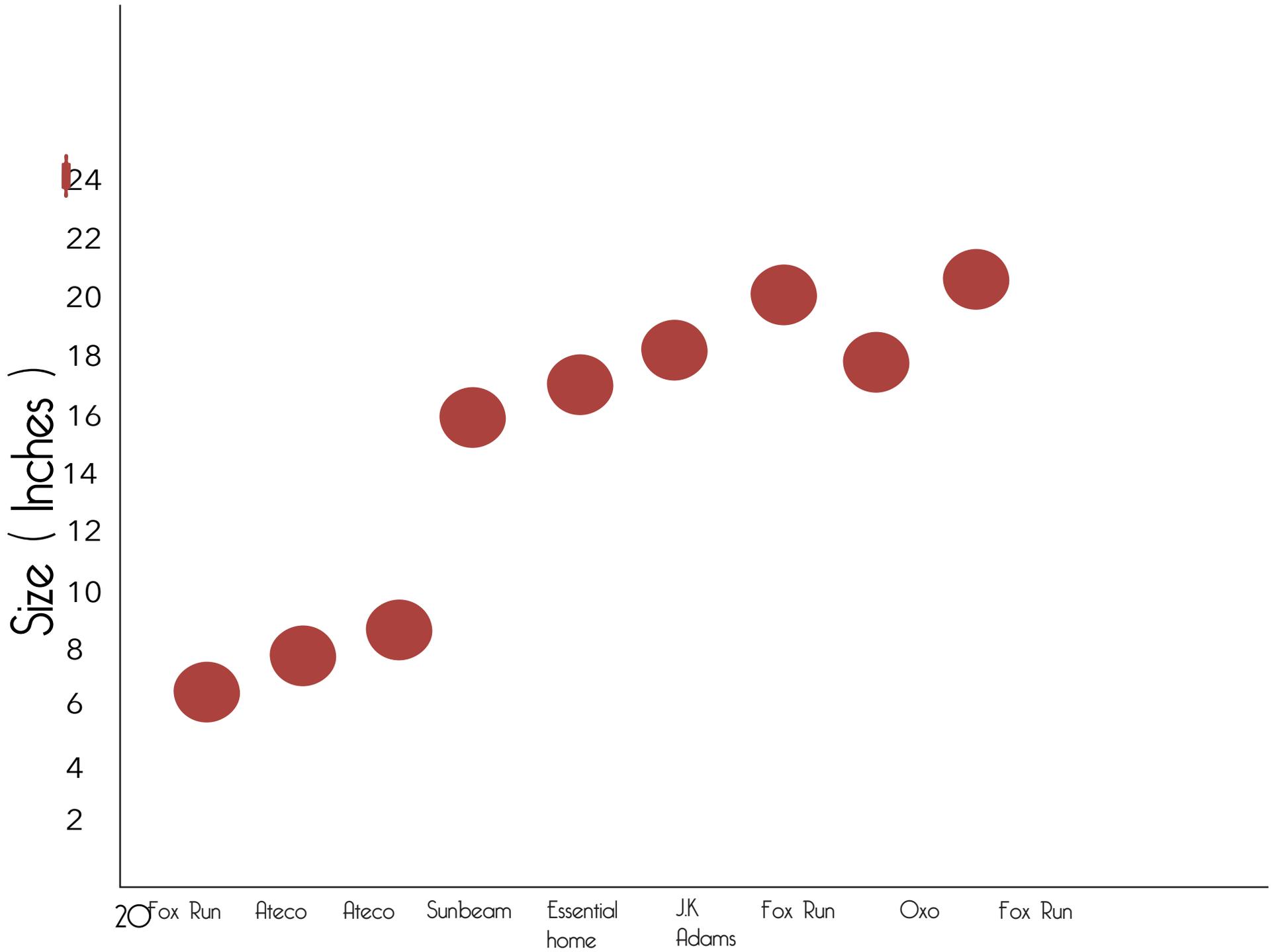


Venn Diagram

Occupation	Male	Female
Commercial Baker	8	5
Home User	2	8
Beginners	2	5
Total Sample	12	18

It is clear from the survey that females use the rolling pin more than the male baker population does.





Manufacturer Location



Dough Survey



Cookie Dough



Sweetcrust pastry Dough



Flaky pastry Dough



Yeast Dough



Fenugreek Dough



Pastry Dough



Croissant Dough



Brioche Dough



Wholewheat Dough



Pasta Dough



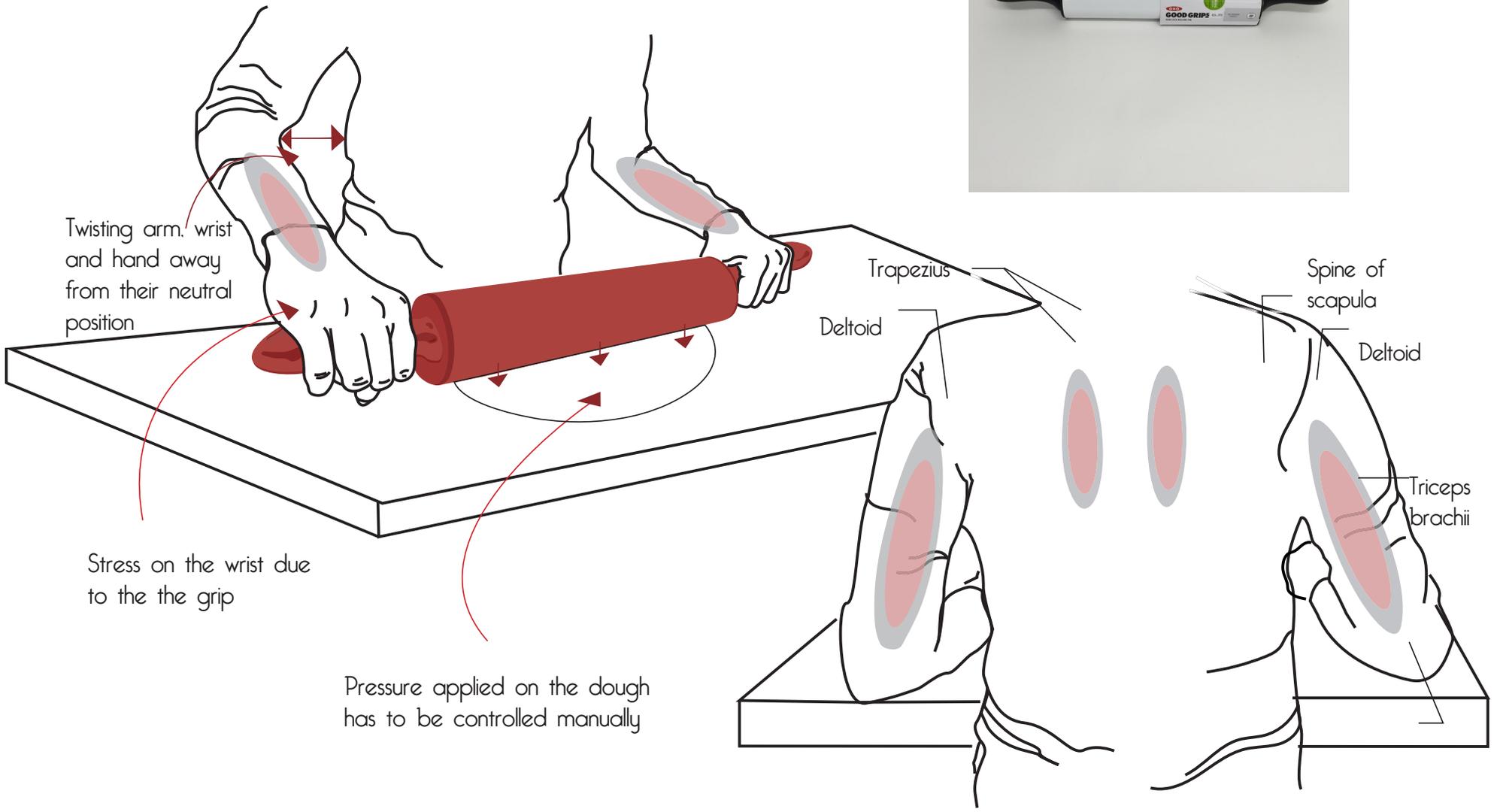
Flour Dough

Increase in Elasticity

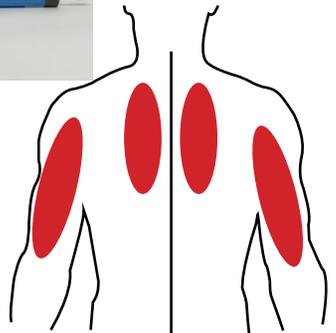
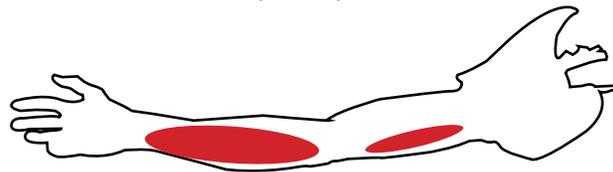
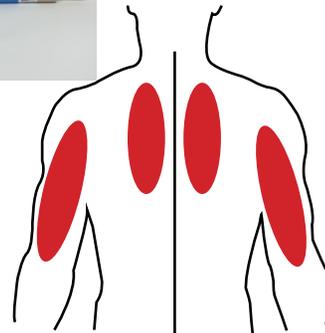
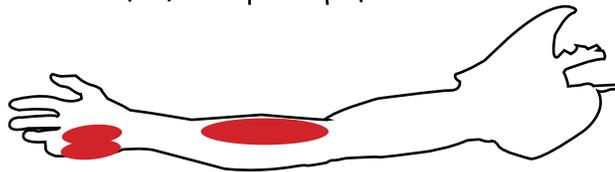
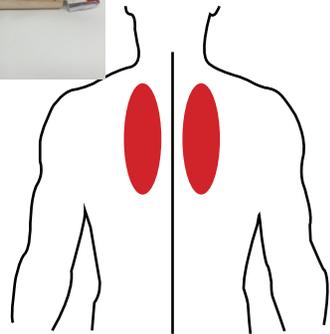
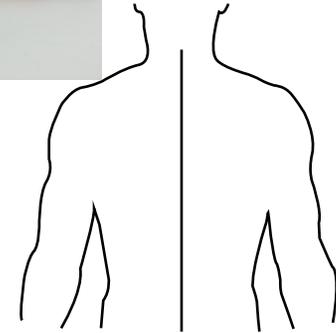
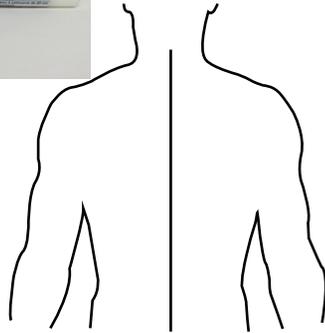
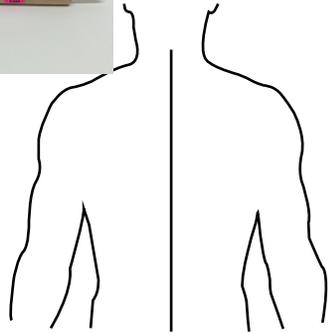
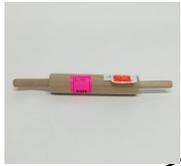
Biomechanics
in relation to
Market Survey

Biomechanics

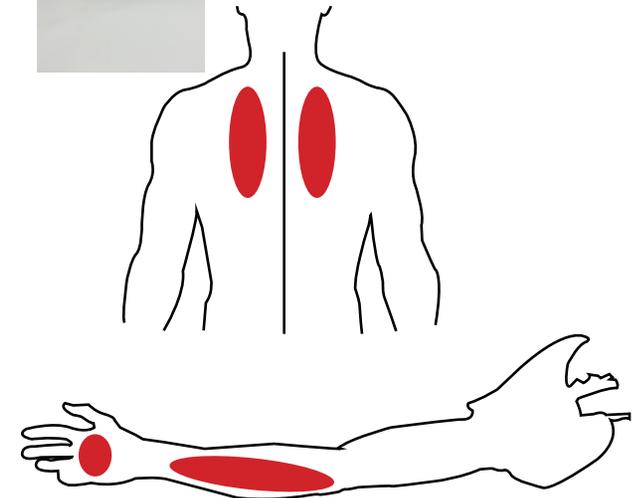
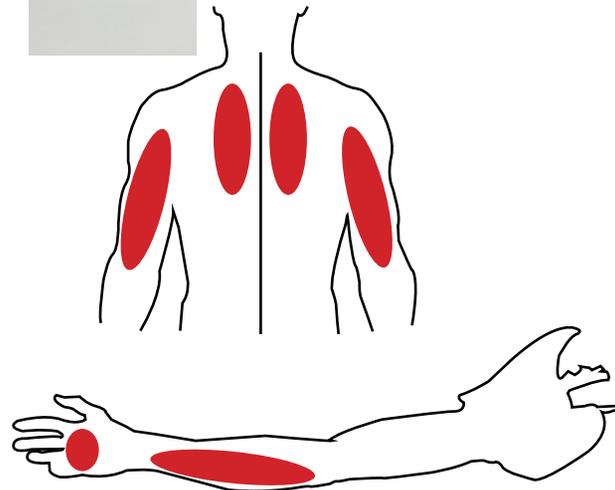
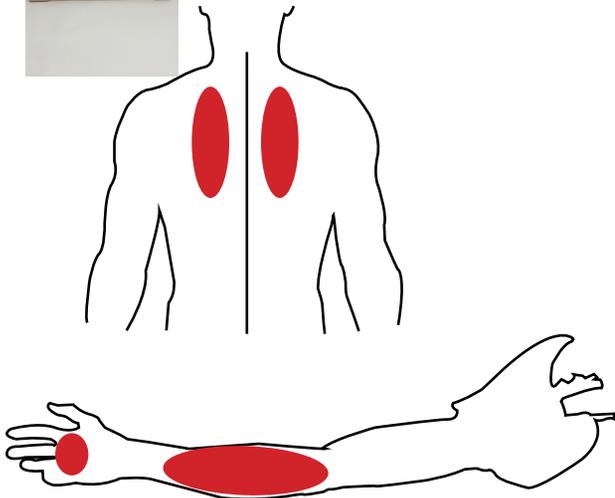
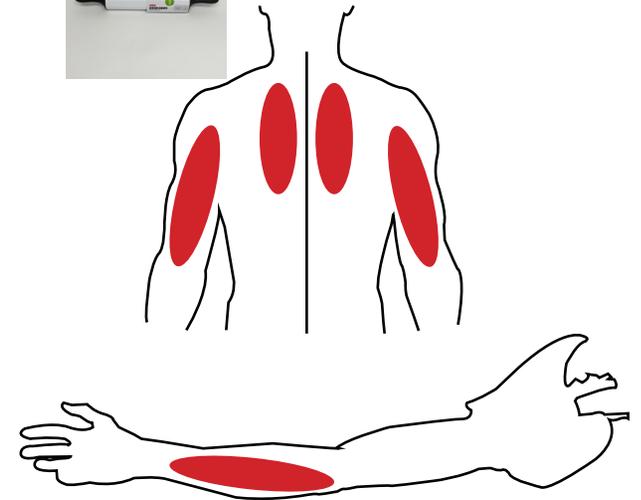
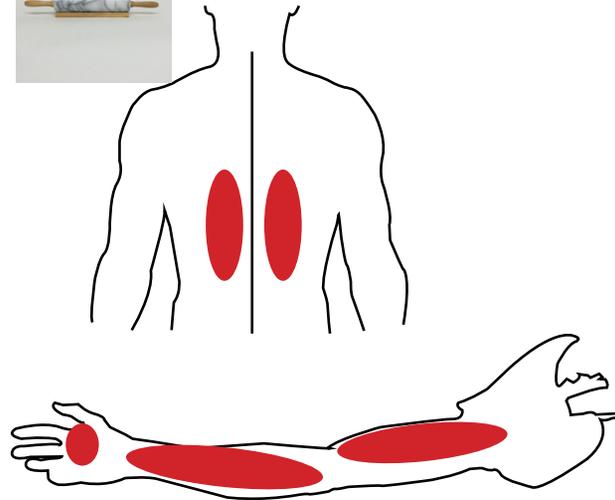
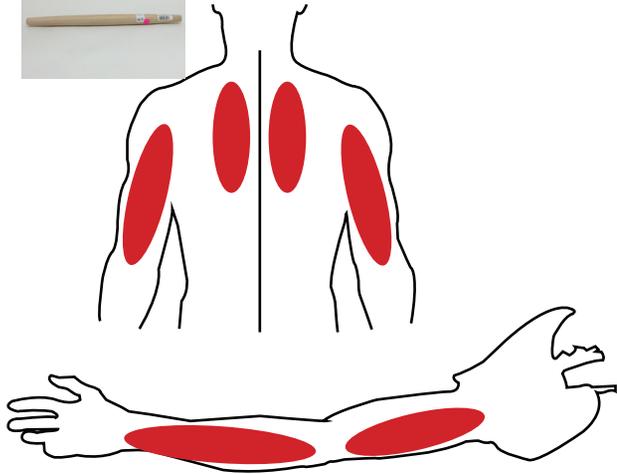
Basics Plus- Most Comfortable



Other Rollings Pins



Other Rollings Pins



DESIGN OPPORTUNITIES

Rolling part
Non-stick
Tapered only at the ends
Light
Smooth
Spinning pin
Spring action after every revolution

A joinery cap

Sprinkle dry floor at regular intervals
on the dough

Base / stand for the rolling pin

Delay the onset of sore muscles

Get rid of causes for permanent physical
impairments

Durable



Materials
Teflon Coating
Wood
Plastic
Glass
Acrylic
Stainless steel

Silicon
Aluminium

Stone(marble)

Handles
Long
Thick
Angled upwards for no hand contact with the
surface
Angled forward
An indication for grip
As knobs for a hollow storage rolling pin
Act as dry floor sprinkler

Soft-

Make people enjoy rolling dough

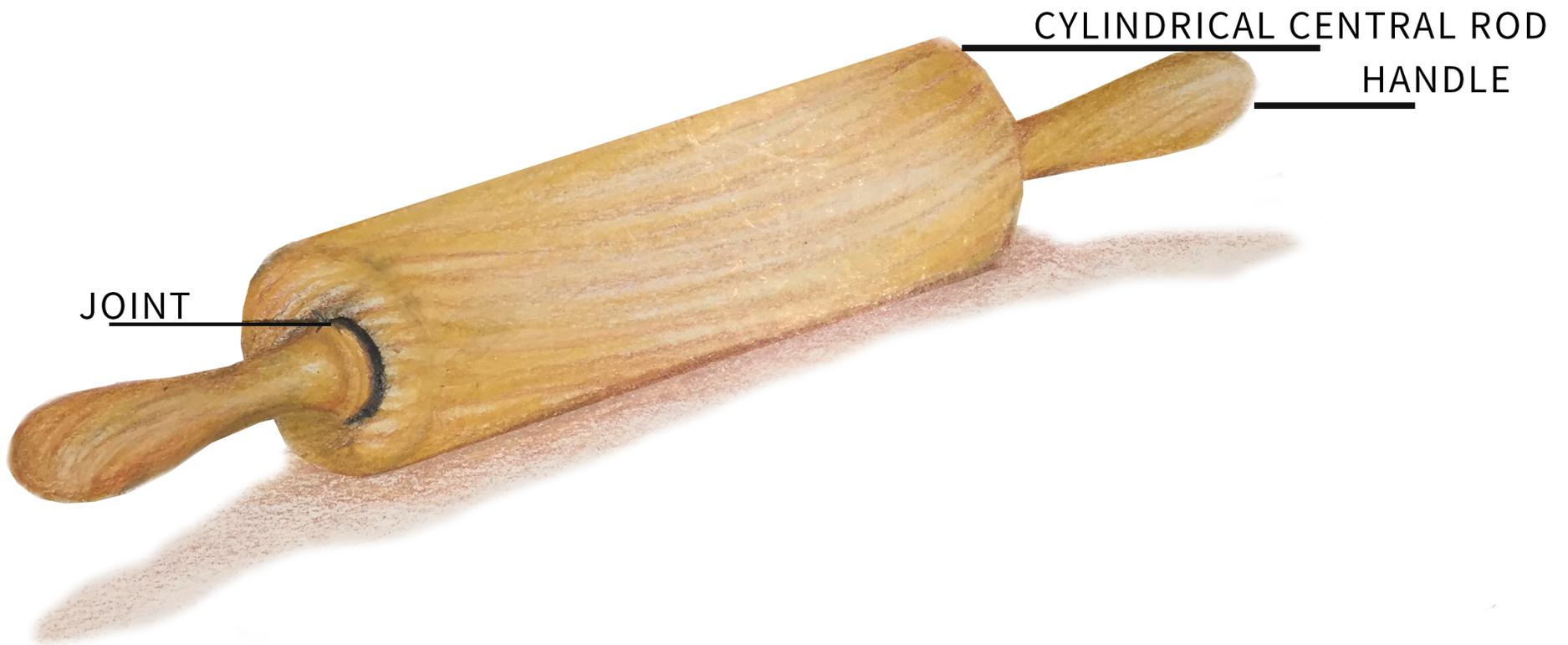
Effortless both visually and functionally

Packaging
In a box
Without Stickers
Organic/biodegradable

Cheap

Brainstorming
Ideation
Development

ROLLING PIN RENDERING



TOOL STUDY



Tapered Handles

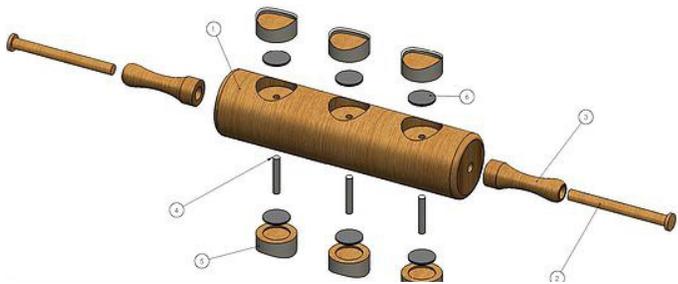


Single piece



Most common Parts:
 Hollow Rolling Pin
 Handles
 Dowel
 Closing caps
 Weights

Interesting Additions:
 Magnets for a better balance of the rolling pin with respect to the handles
 Flour sprinkler
 Self riding feature



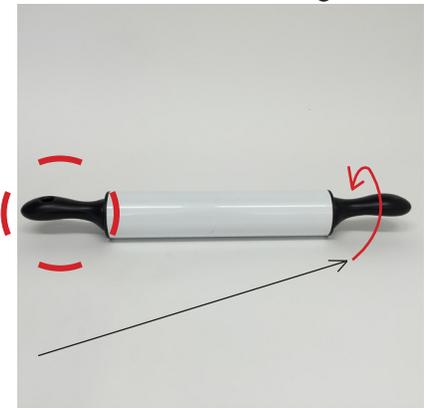
Not angled towards the user
 Not adjustable
 Biodegradable
 Smooth finish
 An instructional 3-D packaging
 Not too heavy
 Packaging

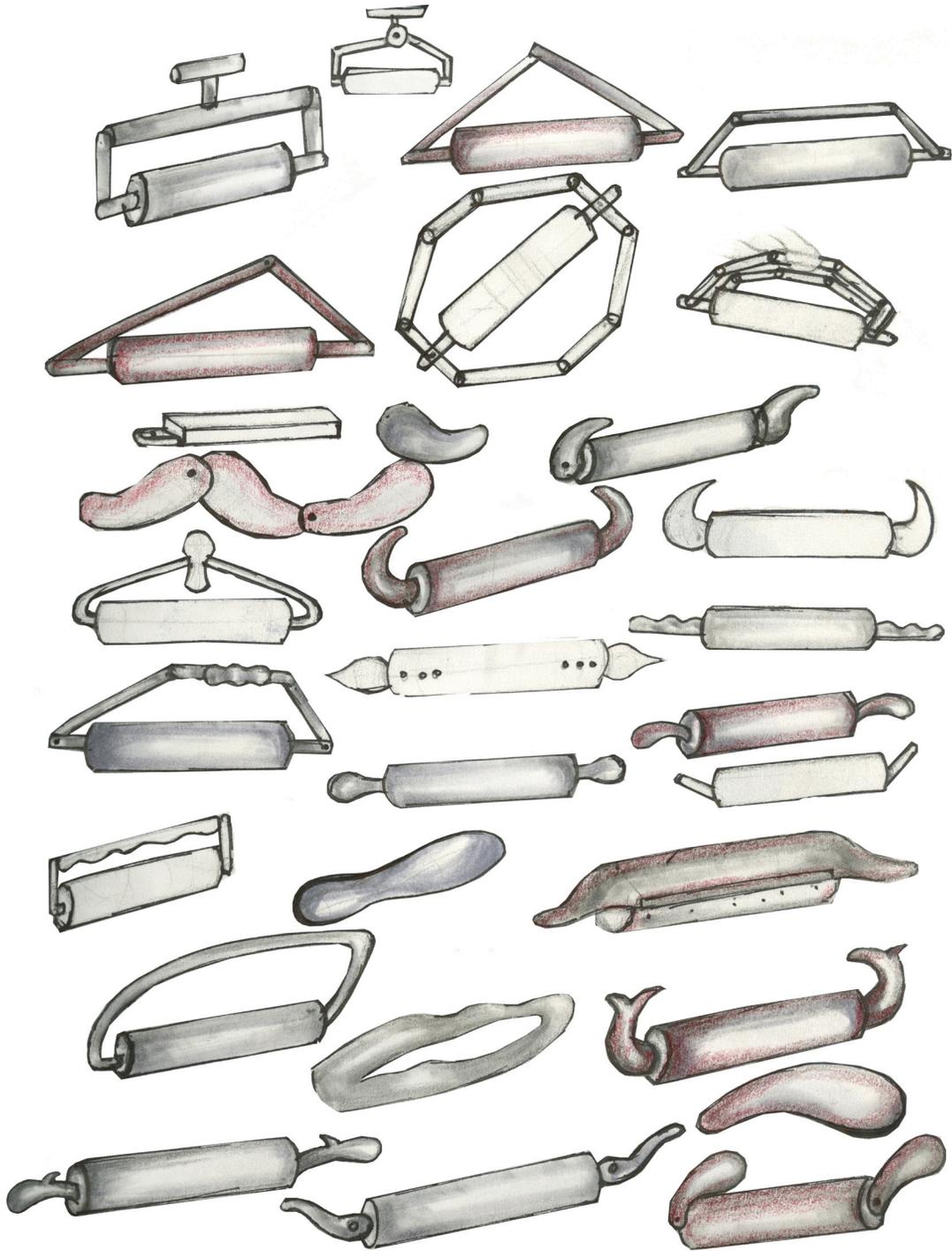
Angled Upwards

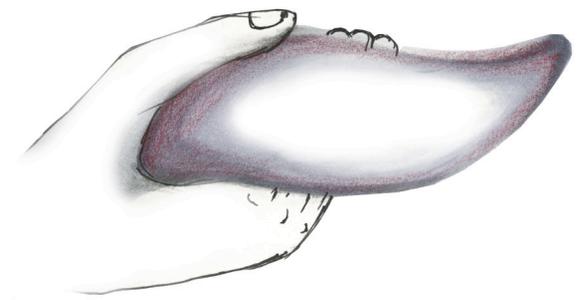


Self Riding

Non-Stick coating

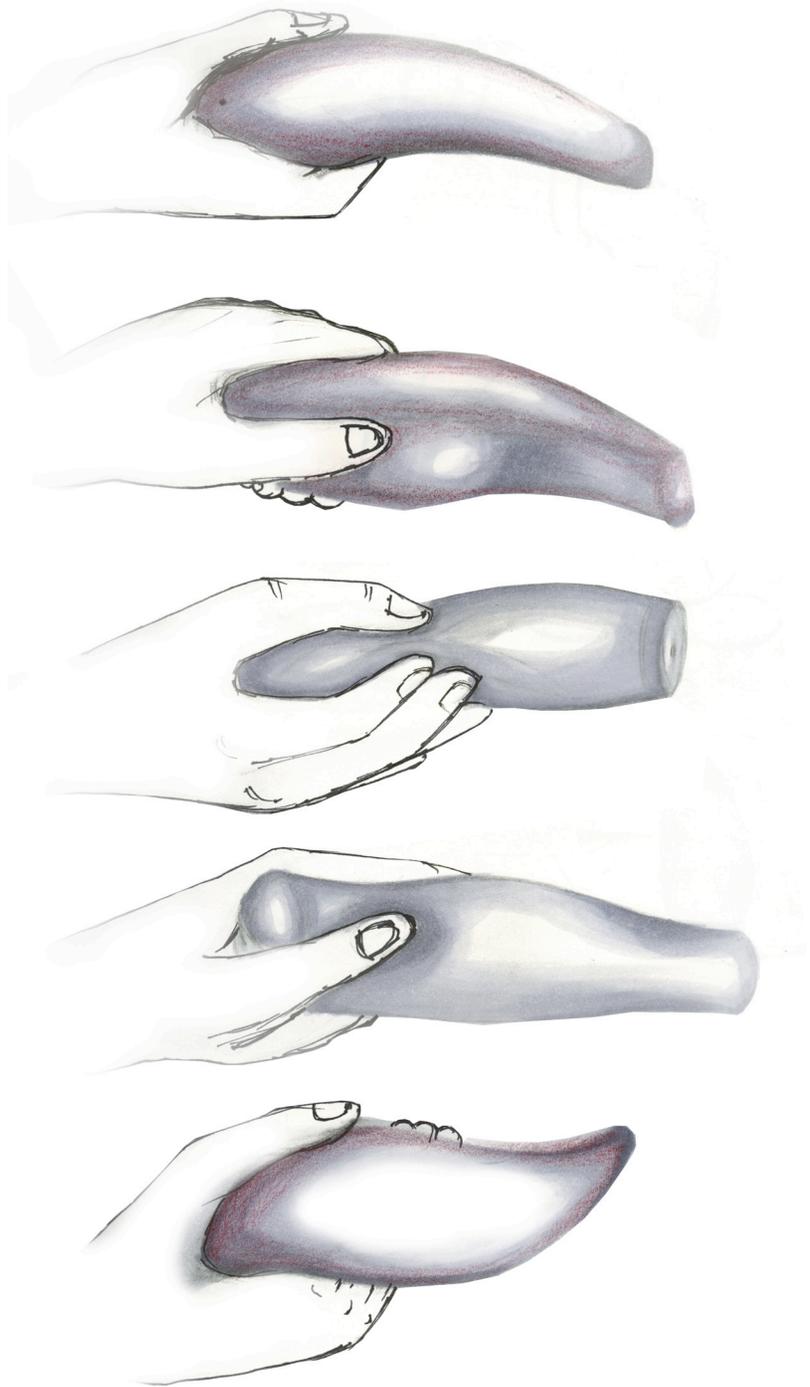






We tested the 4 initial bucks with various people's hands for universal design which meant change in size, age, strength and gender. The form and function was pretty successful but the fingers were getting locked on the upward curve. We therefore added material on the bottom to fit fingers of any size. We also liked the feminine shape of this buck.



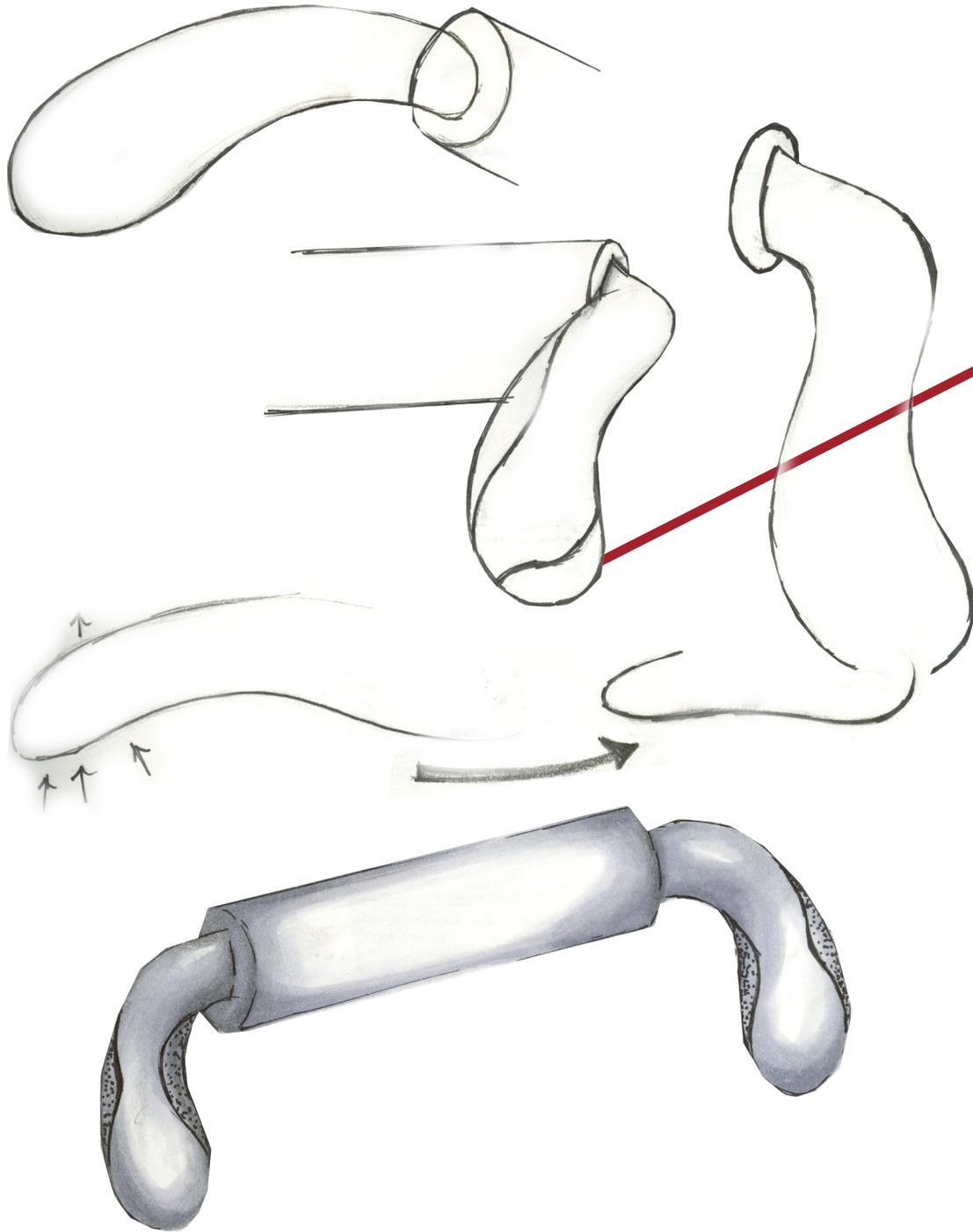


Final Handles



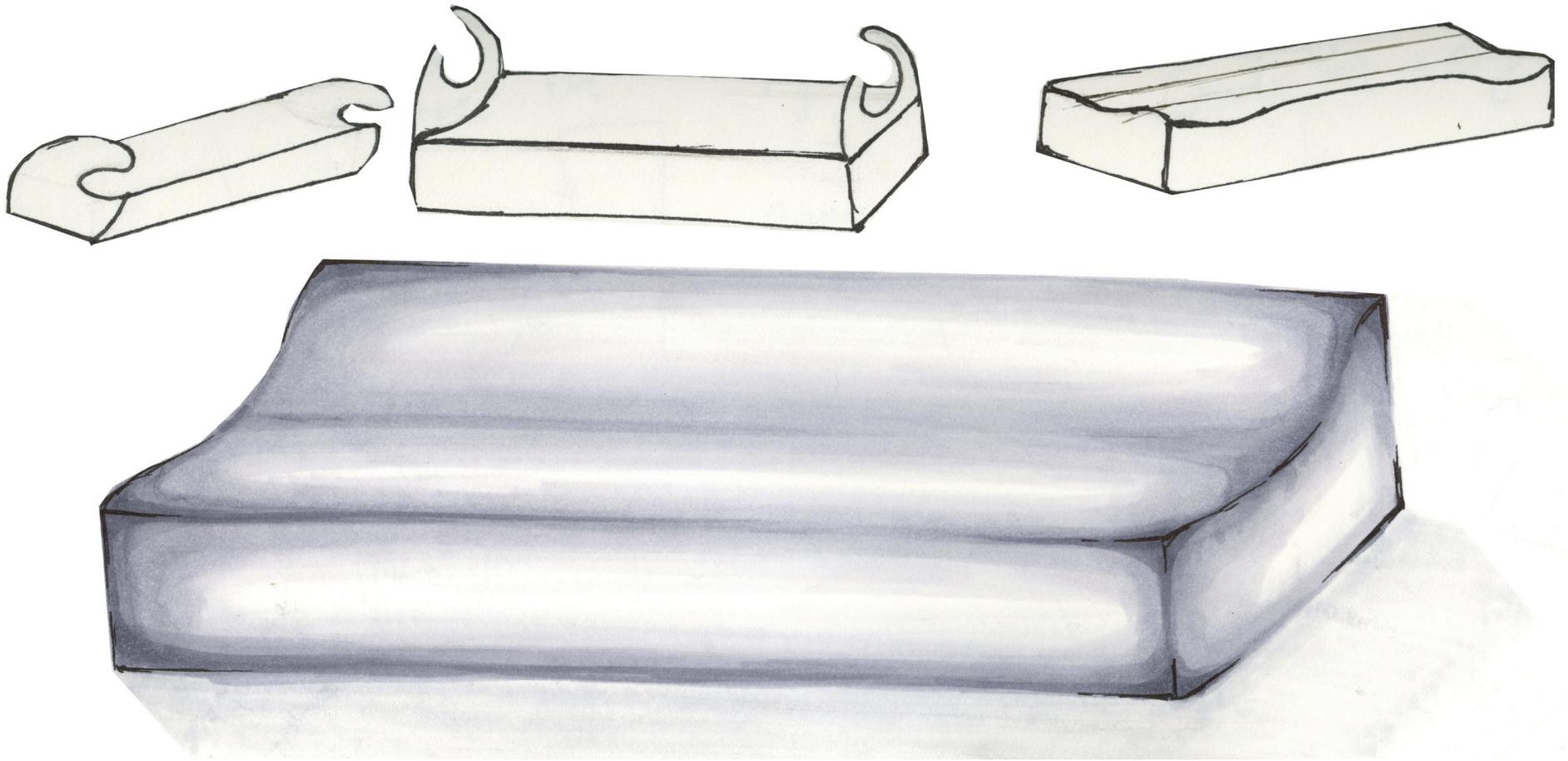
After trying out different models, we ended up with this shape. This handle has a small uplifted angle at the bottom for the finger grip and following that a small uplifted bulge for the thumb rest. The angles were kept minimum to make the handle a universal one.

The handles will be attached vertically to the rolling pin to let the upper body stay in a neutral position and not twist. They are attached to a rod inside the pin, therefore they move freely at arbitrary angles to comfort all users' abilities and preferences. Due to free rotation and shape, the handles can be flipped away from the user to act as a power grip and flipped back towards the user for a precision grip.



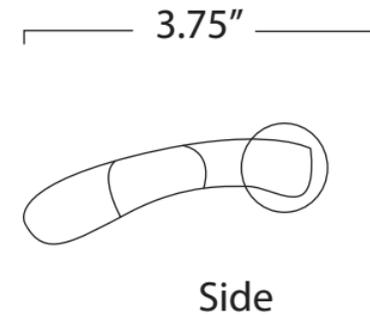
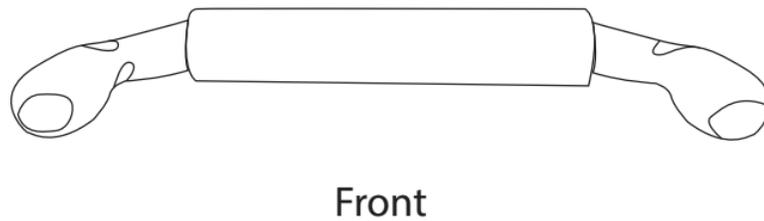
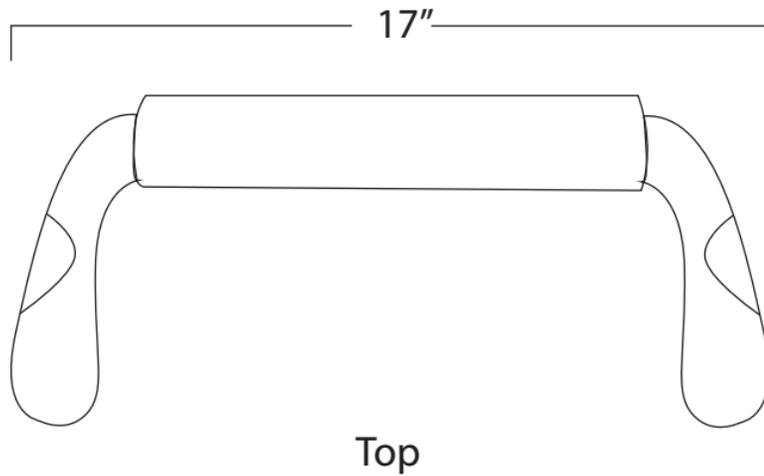
Cork: Soft, Flexible, Sustainable, waterproof

After our handles type was decided, we started figuring out how to make them part of the rolling pin in a cohesive fashion. In addition to that we wanted to add a soft padding in the middle and at the end to make the user more comfortable with the grip and allow minimal squeezing of the grip to their hand shape. The end padding would act as breaks for the rolling pin when it is left unattended by the user.



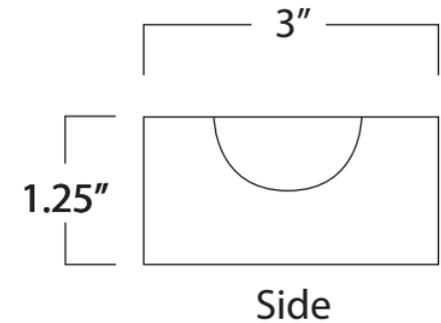
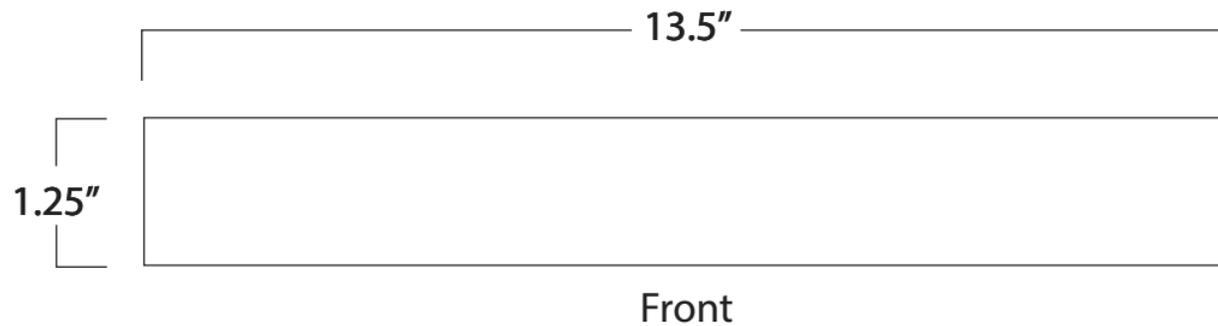
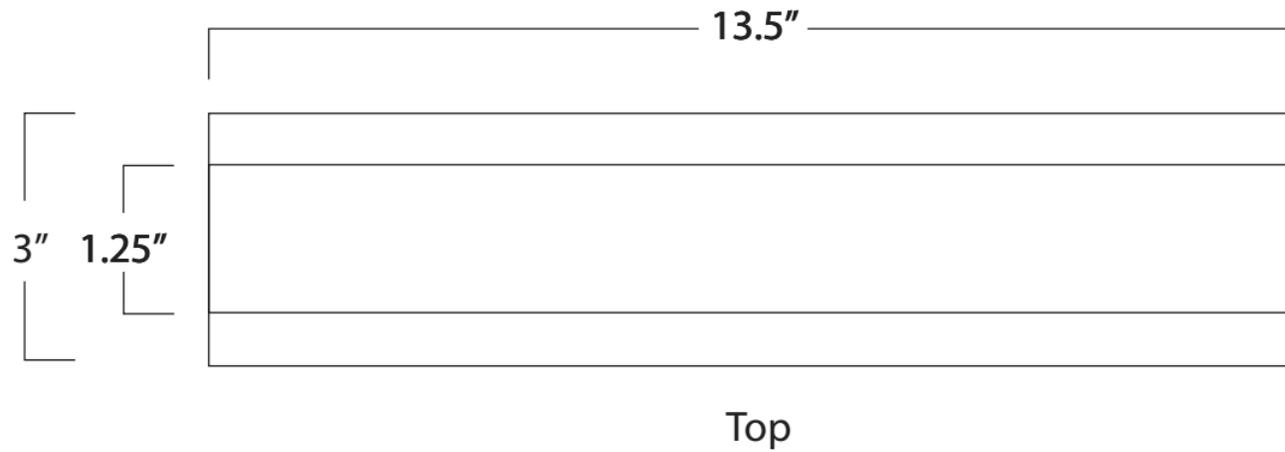
To avoid any further accidental rolling away and to keep the rolling pin clean and dry at all times, we made a stand for the rolling pin where it can rest when it is not in use.

Orthographic Drawing



Rolling pin orthographic drawing

Orthographic Drawing



Rolling pin base orthographic drawing

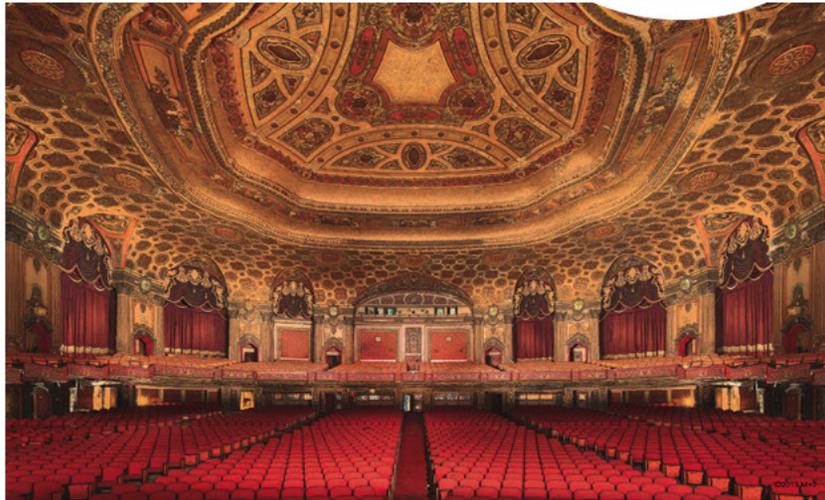
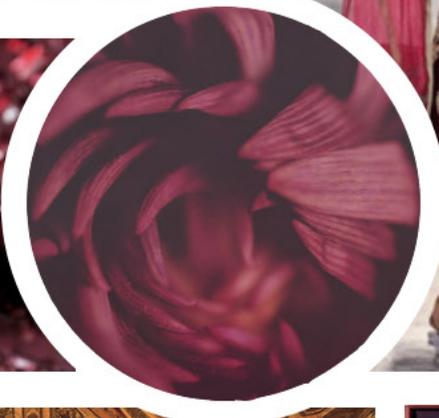
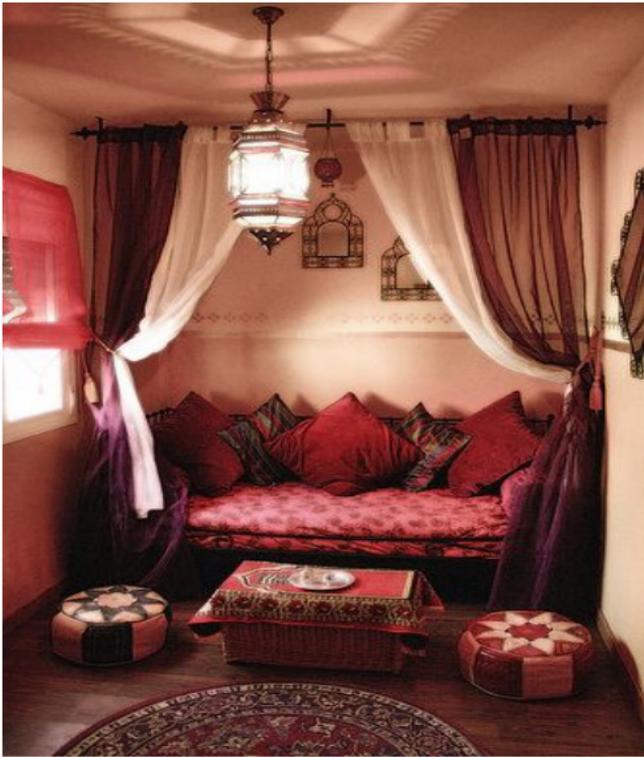
Final Design

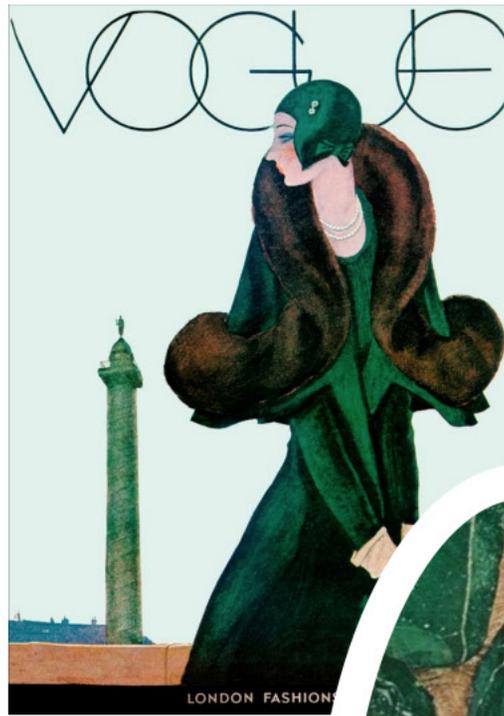


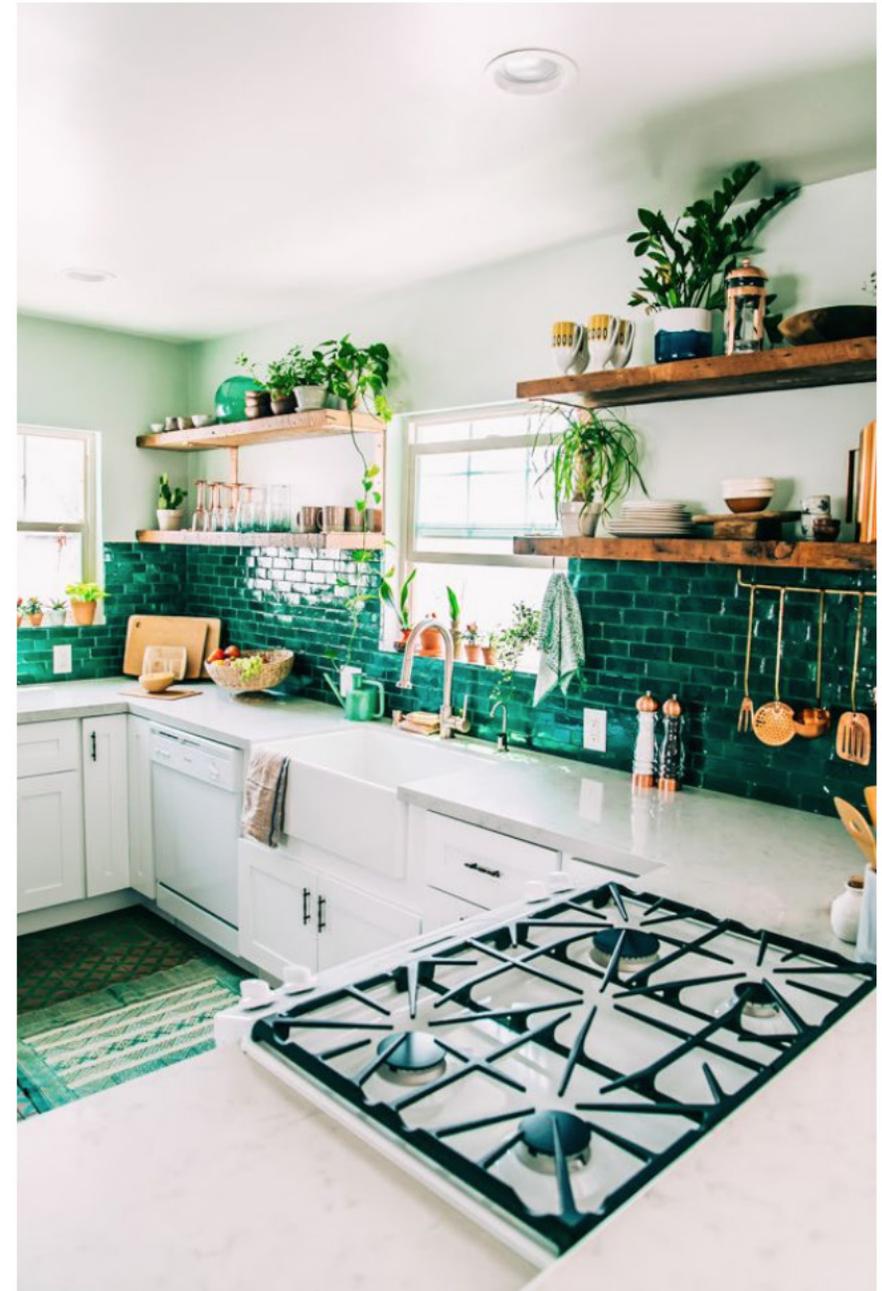
Color Study

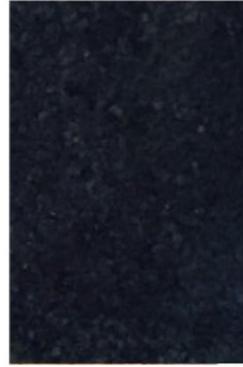
Cork

Packaging









Final Product



Final Function

1. Pick up the rolling pin through the handles from the stand.
2. Get a dough on a clean smooth surface.
3. Make sure the height of the table top is above your stomach level.(Advisable)
4. If you want to be precise and delicate with your dough, keep the handles towards you and have more control over the pin and dough.
5. If you want to flatten your dough with more pressure or your dough is very elastic, flip the handles away from you and rest your palm around the cork area(in the middle) so as get closer to the pin and dough and apply more pressure on the dough without stressing your upper body
6. If you have to leave the rolling pin on the table top unattended for sometime, don't worry about any accidental rolling over of the pin: the cork breaks at the edge of the handles and shape of the handles will provide friction to the rolling pin motion.
7. Ready Again? Complete the rolling and simply put it on the stand when done.

Benefits

1. No Pain, Yes Gain- No more upper body exertion even after long periods of time. Since your arms, hands and wrists are in neutral position, you will be rolling your favourite dough in your most comfortable position. Also your wrists are not going to stress because of the uplifted angled shaped of the handle. The Instructional soft cork will add more comfort to your grip.
2. You can roll any type of dough without extra exertion on more elastic doughs.
3. No more rolling pin falling on your feet- The stand and handle breaks prevent it.
4. Make this rolling pin adorn your kitchen and not just let it lie around in a dingy corner - If you got it, Show it!

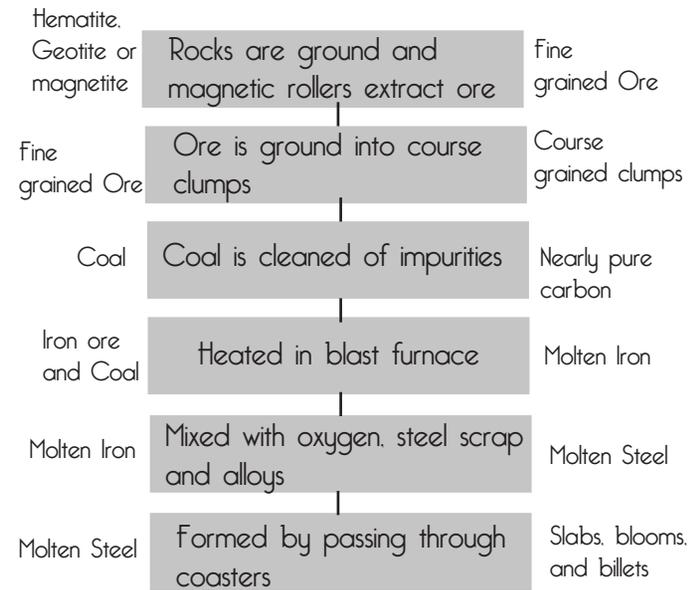
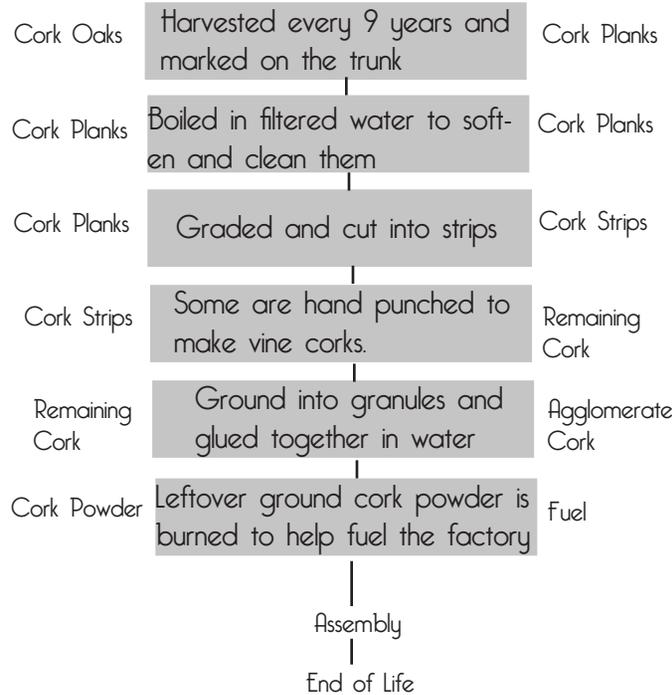
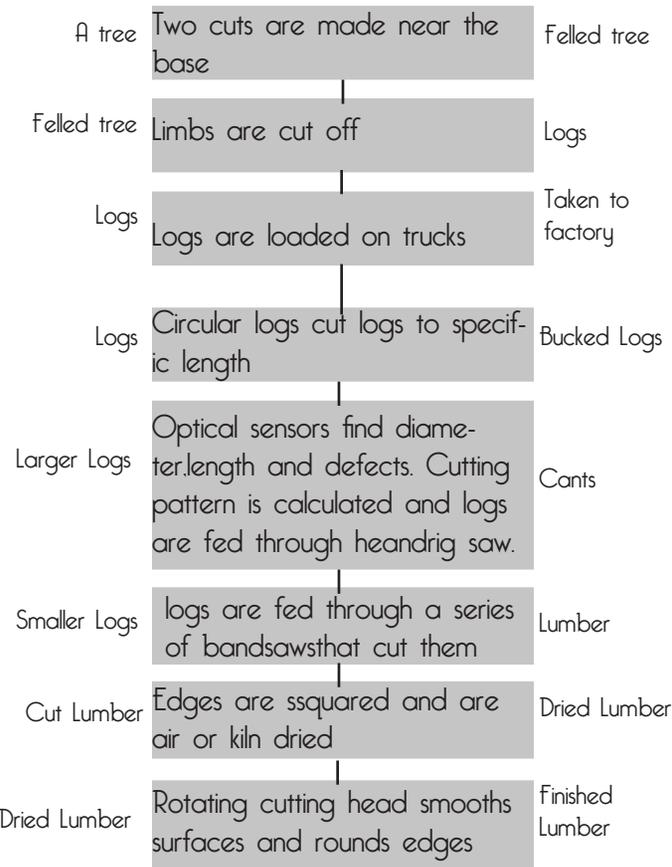
Process Tree and Exploded View



A tree

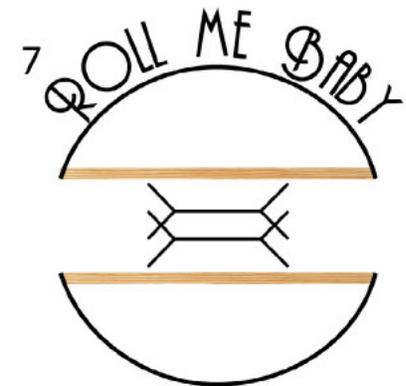
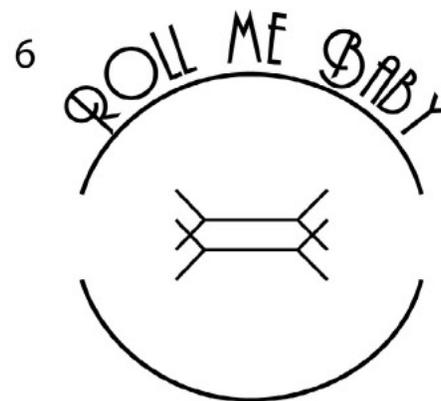
Cork

Steel



Branding

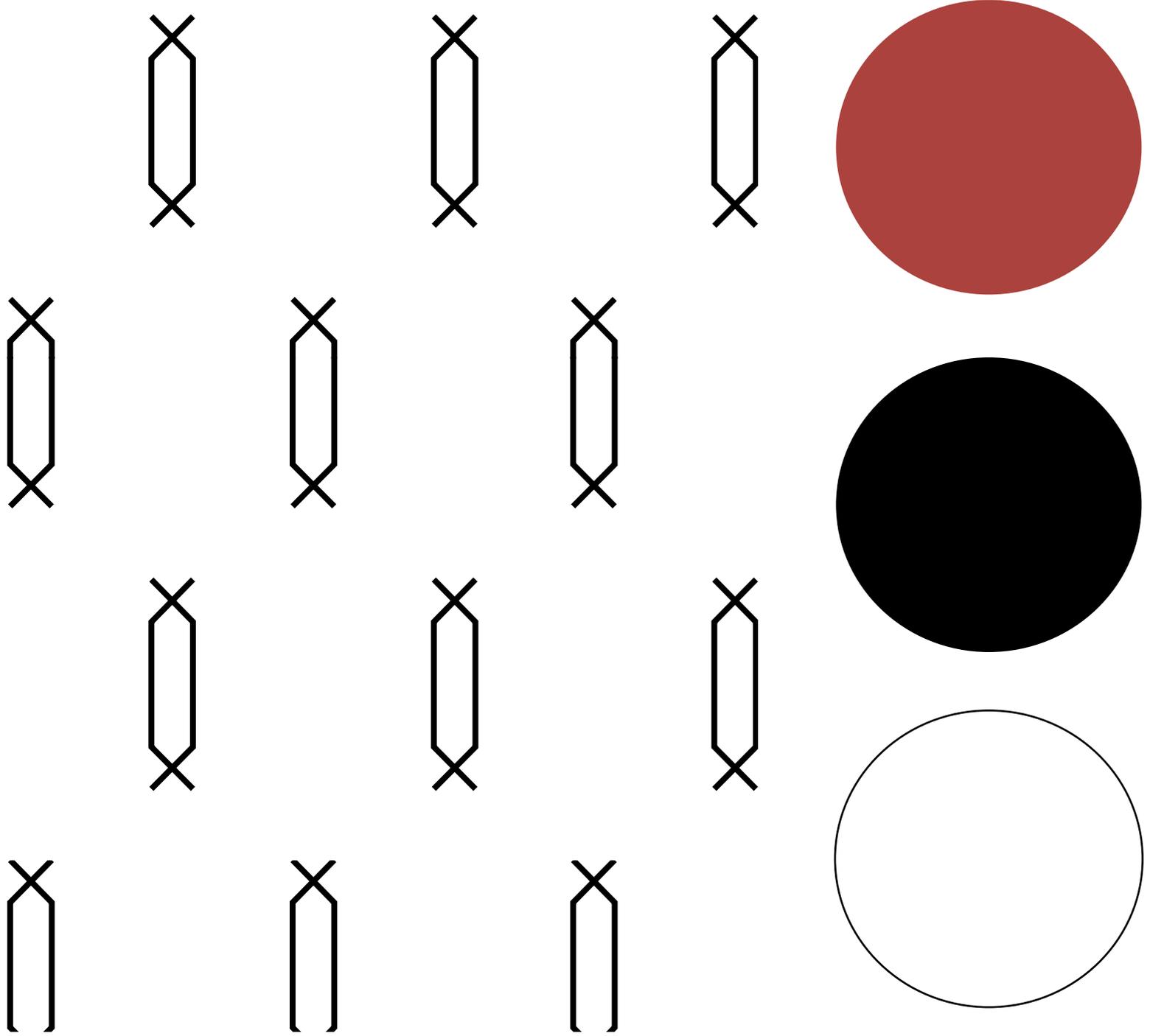
Logos



Final Logo



Packaging Concept



Roll Me Baby is a universal rolling pin that caters to the home and commercial baker.

Designed to alleviate strain on the wrist, the dual action roller allows the user to choose between the power and precision grip when necessary.



Power grip

The handles when flipped 180 degrees clockwise would give you the power grip which will allow you to put more pressure on the dough while rolling. Your palms in this case can also rest on the handle.



Precision Grip

The current position of handles is the normal grip or the precision grip which allows you to put less pressure on the dough and roll it to achieve your desired dough shape and size.



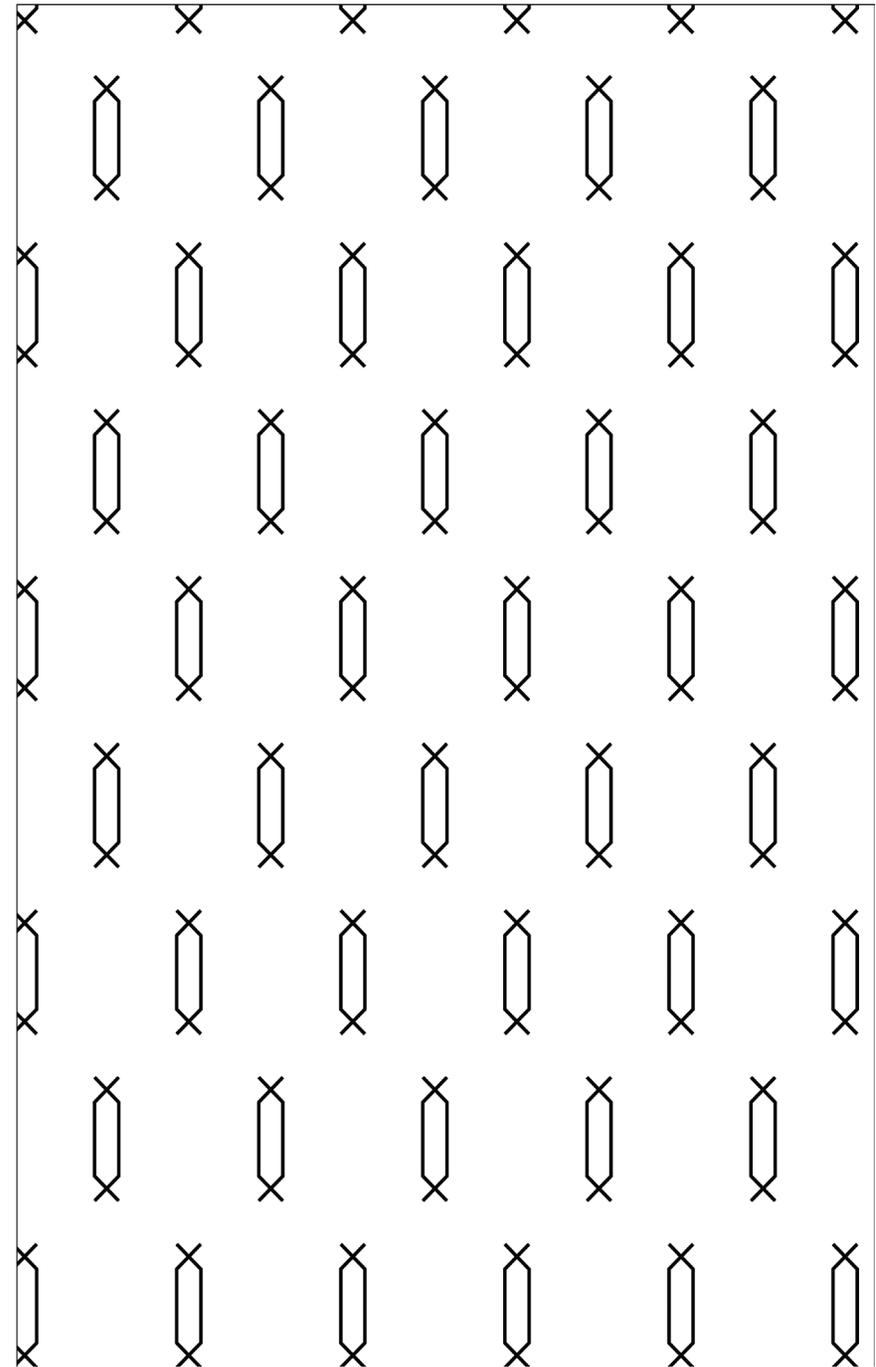
Don't roll your wrist, roll your dough.

Designed in New York



Price: \$35

- | | |
|-------------------------|--------------------------|
| Dual grip | Easy Storage |
| Sustainable | Rolling stopper(handles) |
| Ergonomically efficient | Kitchen safe |





The packaging is sustainable, attractive, stable and functional too. When the consumer approaches the product, he/she can hold the handles to see how comfortable they are before sale.



Universal Design Principles

Roll me baby

EQUITABLE USE

Long, tapered shape allows any hand size to fit on handles

FLEXIBILITY IN USE

Pin can be used as a precision or a power grip based on whether the handles are towards the user or away from him respectively.

SIMPLE AND INTUITIVE USE

To change function, handles can be flipped over easily without many instructions. The principle also resonates through the packaging.

PERCEPTIBLE INFORMATION

Cork, dip in the stand and information on packaging instruct the user how to efficiently use the product.

TOLERANCE OF ERROR

Storage stand and cork grip at the end of each handle prevent the rolling pin from rolling off counter.

SIZE AND SPACE FOR APPROACH AND USE

Handles are perpendicular to the rolling pin which hence requires least stretchig of body occupying a wider area. The handles rotate therefore the user can adjust his rolling angle according to height.

LOW PHYSICAL EFFORT

Due to vertical handles, elevated, organic shaped handles, and dual grip, the product requires least physical effort without compromising on its function



Presicion Grip

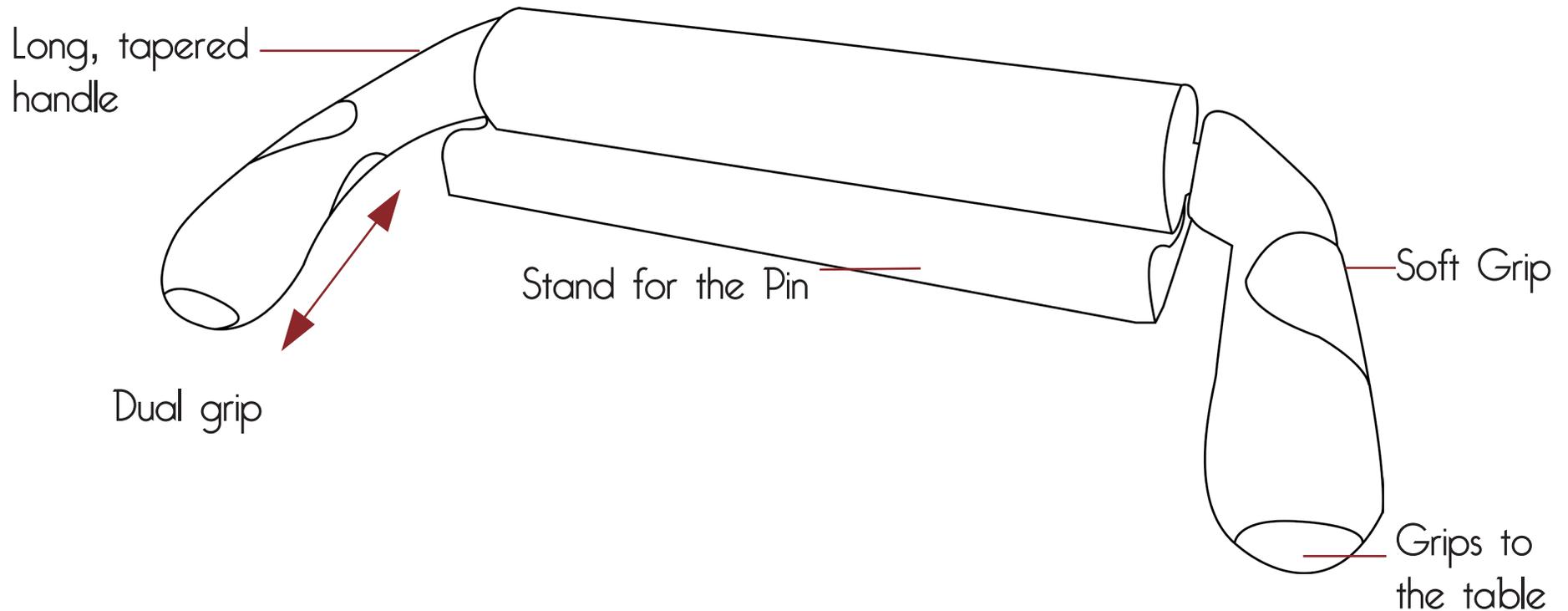


Power Grip

User Feedback

According to many bakers, using a rolling pin requires a lot of energy. Therefore at many instances they flatten the dough using their palms. While some use a stainless steel pin with horizontal handles, the dough often sticks to it.

With our rolling pin however, they say that they would use it more often due to the soft grip and angled handles. They like that the pin requires little pressure. and feels that dough would not stick on it. They like and understand the product through the packaging too.







ROLL ME BABY

REINVENTING

ROLLING