Requirements

Requirements

Listing of Requirements..

1. Ease of Cleaning
2. Modular Blade Design
3. ~~Adjustable Speed Settings~~
4. Quick Drying
5. Weight Optimization
6. Heat Management
7. Secure Lid Closure
8. ~~Uniform Chopping Results~~
9. ~~Mix periodically~~

Needs

Flexibility to change the blades

Grip for Secure and Safe chopping

Easy Cleaning

Secure Lid Closure

Fine and Uniform Chopping

Quick Drying

Requirements

Listing of Requirements..

1	2	3	4	5	6	7
Flexibility to change blades	Easy Cleaning	Uniform Chopping	Base Grip	Secure Lid Closure	Cost	Circularity

Matrix Method

Customer Requirements

1. Modular Blade Design
2. Easy Cleaning
3. Uniform Chopping
4. Grip
5. Secure Lid Closure
6. Cost
7. Circularity

	1	2	3	4	5	6	7	Sum
1	--	1	1	0.5	1	0.5	0.5	4.5
2	0	--	0.5	0	1	1	0	2.5
3	0	0.5	--	0	0.5	0.5	0.5	2
4	0.5	1	1	--	0.5	0	0.5	3.5
5	0	0	0.5	0.5	--	0	1	2
6	0.5	0	0.5	1	1	--	0.5	3.5
7	0.5	0	0.5	0.5	0	0.5	--	2

Rank

1. Modular Blade Design
2. Easy Cleaning
3. Circularity
4. Uniform Chopping
5. Easy Cleaning
6. Secure Lid Closure
7. Grip

Technical Requirements

Requirements	Metrics	Ideal Value
Multifunction chopper Blade	Standard attachment system	
Easy cleaning	Cleaning time	5-10 Mins
	Minimum Crevices	
Uniform Chopping	Size variance of chopped ingredients (mm)	3 to 6mm
	Motor RPM	1000-2000rpm
	Motor Power	200-500W
Base Grip	Nonslip	
Secure Lid Closure	Lid locking mechanism	100% Airtight (No leakage)

Technical Requirements

Requirements	Metrics	Ideal Value
Base Grip	Nonslip	
Secure Lid Closure	Lid locking mechanism	100% Airtight (No leakage)
Cost	Rupees	1500 – 2000 Rs
Circularity	Recyclable Material	
	Durable	

Relative Importance

QFD

1. Standard attachment system
2. Cleaning time
3. Minimum Crevices
4. Size of chopped ingredient
5. Motor rpm
6. Motor Power
7. Nonslip
8. Locking mechanism
9. Recyclable Material
10. Durable

	1	2	3	4	5	6	7	8	9	10	Sum
1	--	1	0.5	0	0.5	1	0.5	0.5	1	0.5	5.5
2	0	--	0	0.5	0	0	0	0	0	0	0.5
3	0.5	1	--	0.5	0.5	0.5	0.5	0.5	0.5	0.5	5
4	1	0.5	0.5	--	0.5	0.5	0	0	0.5	0.5	4
5	0.5	1	0.5	0.5	--	0.5	0.5	0	0.5	0.5	4.5
6	0	1	0.5	0.5	0.5	--	0.5	0.5	0.5	0.5	4.5
7	0.5	1	0.5	1	0.5	0.5	--	0.5	0	0	4.5
8	0.5	1	0.5	1	1	0.5	0.5	--	0	0	5
9	0	1	0.5	0.5	0.5	0.5	1	1		0.5	5.5
10	0.5	1	0.5	0.5	0.5	0.5	1	1	0.5		6

Product Evaluation

QFD

Our product

Competitor product

Product Evaluation

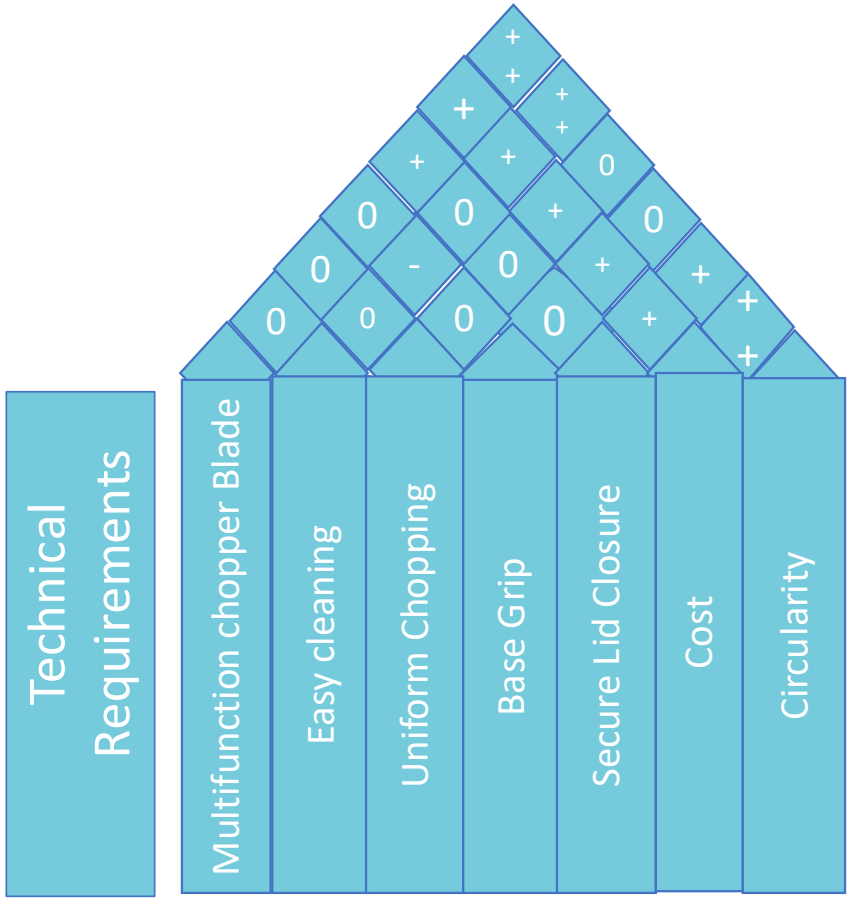
QFD

Borosil

Prestige

	1	2	3	4	5	Target Value	Improvement Rate	Weight
Multifunction chopper Blade [5]						5	1.25	6.25
Uniform Chopping [3]						4	1.3	5.2
Circularity [3]						4	1.3	5.2
Easy Cleaning[2.5]						3	1.2	3.6
Secure Lid Closure [1.5]						2	1.3	2.6
Cost [4.5]						5	1.1	5.5
Grip[0.5]						1	2	2

Interrelationship b/w Technical Parameters



Target Values

QFD

	1	2	3	4	5	6	7	8
Prestige	0	10mins	5-7mm	-	120mm	80mm	-	250W
Borosil	0	15mins	-	-	126mm	100mm	-	260W
Target Value	<=3	5-10mins	3-5mm	1500rpm	120-130mm	30-50mm		

Patent Study

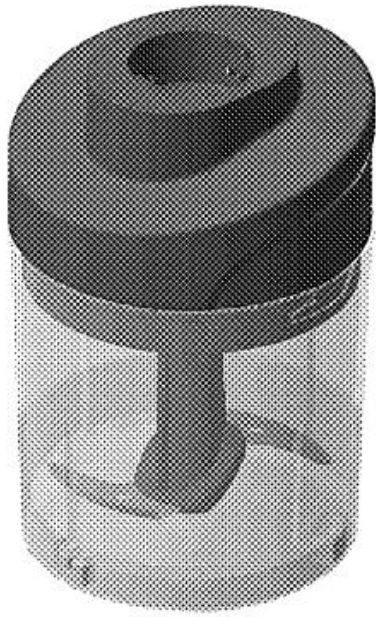
Patent Study

The existing Patents for Electric Chopper and its electronic circuit components are mainly design patents.

The Patent number US D933,417S has been awarded in OCT, 19, 2021 to **Sophie Bourgeois and it was filed by Babyliss Faco SPRL.**

CLAIM

- The ornamental design for an electric chopper, as shown and described.



Ref : USD950305S1 - Electric chopper - Google Patents

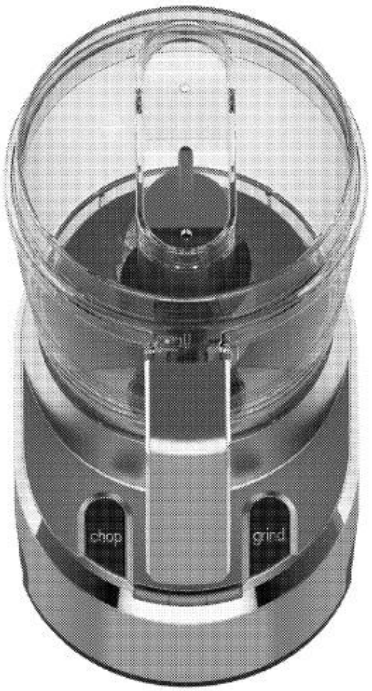
Patent Study

Patent no.	Inventor	Country	References
US D933,417S OCT, 19, 2021	Sophie Bourgeois	USA	USD950305S1 - Electric chopper - Google Patents
DE550617C	H Putsch G mbh & Co	Germany	DE550617C - Electrically powered chopping machine - Google Patents
D999587	Sophie Bourgeois	USA	US Patent for Electric chopper Patent (Patent # D 999,587 issued September 26, 2023) - Justia Patents Search

Patent Study

1.3

1.7



1.8

Ref : [USD950305S1 - Electric chopper - Google Patents]

Solution Neutral Problem Statement

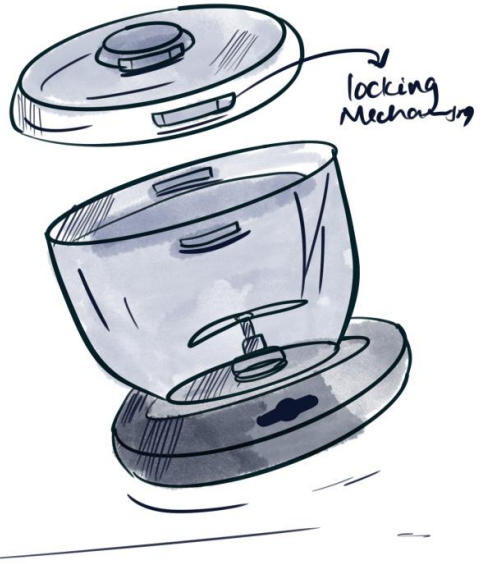
Current electric choppers available in the Indian market often suffer from design flaws that lead to inconsistent results, cleaning difficulties, premature product failure, safety concerns, and a lack of environmentally sustainable practices in their design and manufacture.

Concepts

Selection of Concepts

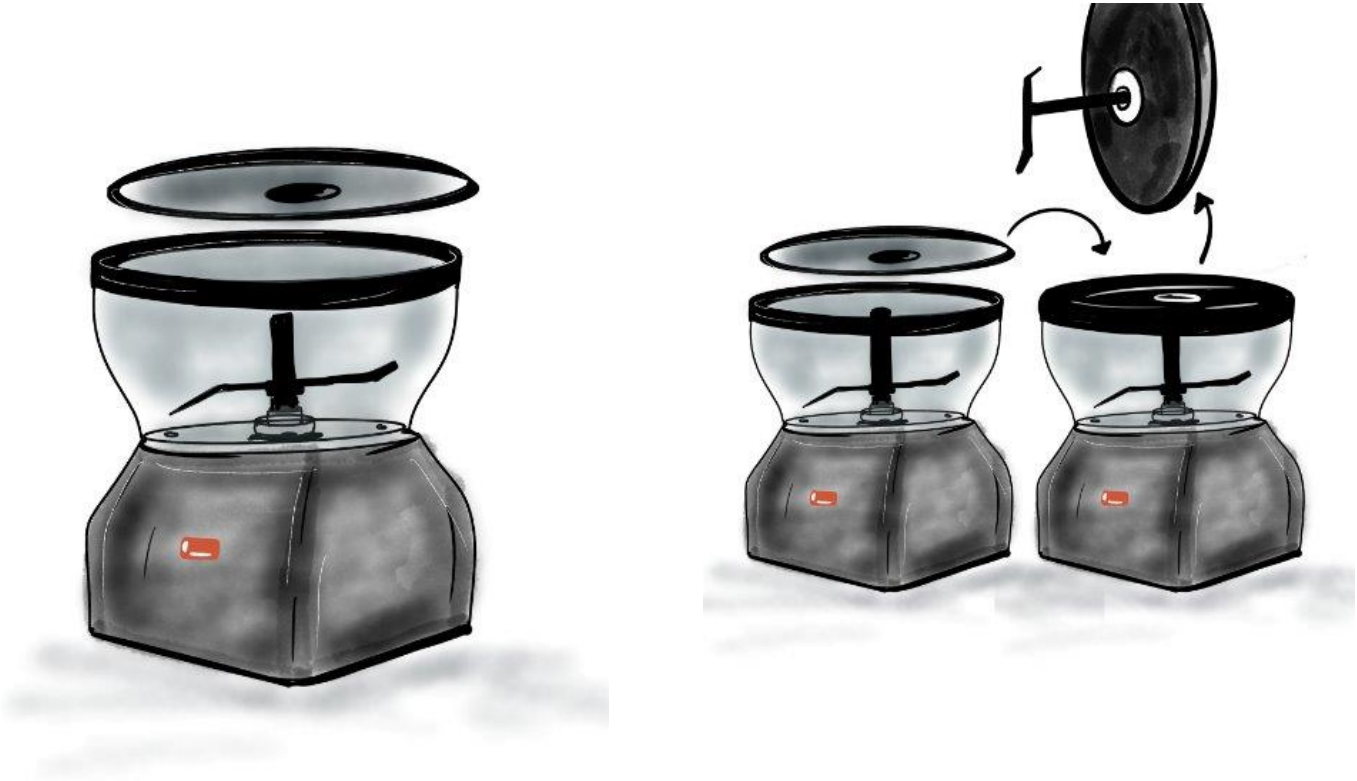
Concepts

Selection of Concepts



Final Concept

Concept



Embodiment

Embodiment Determining Requirements

Layout

- **Form Factor:** Shape of the base, bowl, and lid impact handling and storage should be appealing.
- **Durability:** Materials must withstand regular use, heat from the motor, and cleaning.
- **Assembly Method:** Designed for ease of assembly and potential repair.
- **Safety:** Locking mechanism should be designed to withstand downward pressure during chopping.
- **Electrical Safety**: Compliance with applicable electrical product safety standards.
- **Ease of Cleaning:** Design favoring easy disassembly and dishwasher-safe parts.
- **Aesthetics:** Color choices and overall design to appeal to target consumers.
- **Bottom Grip** for firm grip and stability during Chopping.
- **Blade Locking** to the shaft for modularity.

Embodiment Determining Requirements

Dimensional view

Dimensions: Must fit within average kitchen storage constraints (countertop or cabinet space).

Bowl Capacity: 3-5 cups

Height: 10-14 inches

Base Diameter: Likely between 5-8 inches, depending on the shape and design.

Weight: 1-2kg for reasonable portability and stability during use.

Bowl Shape: Cylindrical bowls are common for efficient chopping . A wider, shallower bowl could reduce height.

Power Cord: A retractable cord or thoughtful storage solution prevents it from entangling and additional effort.

Embodiment Determining Requirements

Materials

Bowl: BPA-free clear plastic (Tritan is durable) or glass (heavier, but heat resistant)

Base: Durable plastic with non-slip feet for stability.

Blades: Stainless steel for sharpness and longevity.

Smooth and non porous inner surface of bowl.

Additional Requirements

Noise level: Target a reasonable volume for user comfort in a home kitchen.

Ease of Cleaning: Dishwasher-safe bowl and lid are ideal. Blade design should allow for easy rinsing.

Durability: Materials and construction should withstand regular use and cleaning.

250-watt motor that operates silently

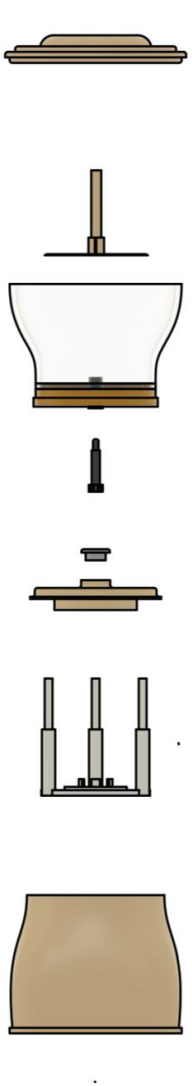
Function Carrier

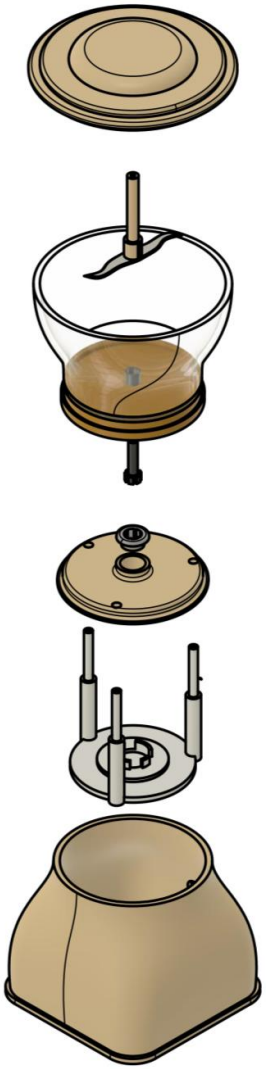
Function		Function Carrier
Multifunction Chopper Blade	Chop, blend, whip	Interchangeable blade set with different blade geometries
Circularity	Recycled material	Bowl, lid
	Design for Assembly and Disassembly	Overall design
Uniform Chopping	Consistent blade rotation speed	Motor Specification
	Sharp blades	Stainless steel with sharp edges

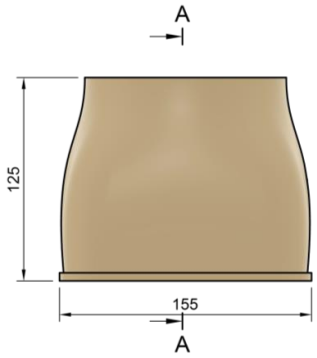
Auxiliary Function

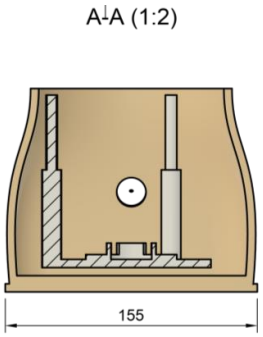
Auxiliary Function	Auxiliary Function Carrier
Power Cord Storage	Wrap-around cord storage
Non-Slip Base Pads	Rubber or silicone feet attached to the bottom
Attachment of motor holder with motor unit	Screws

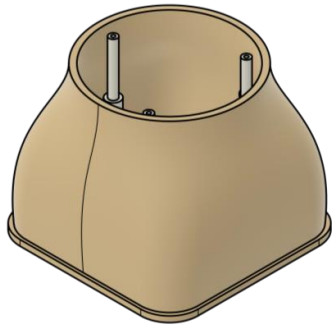
Exploded View & Details



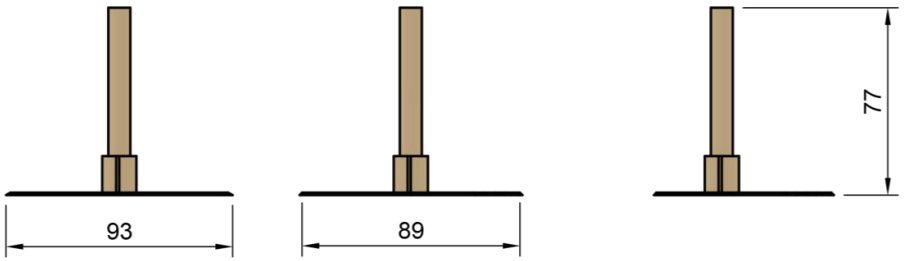


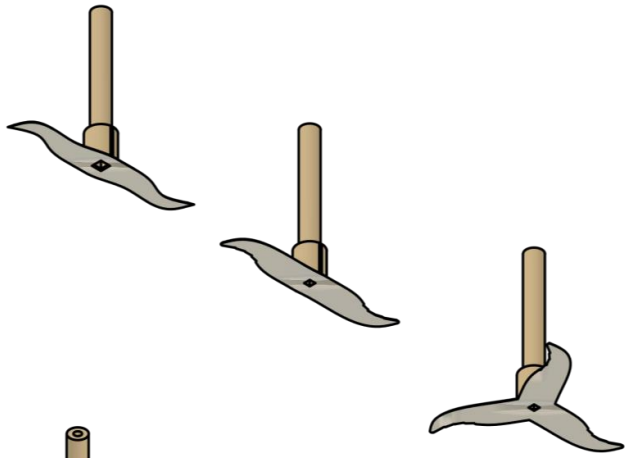


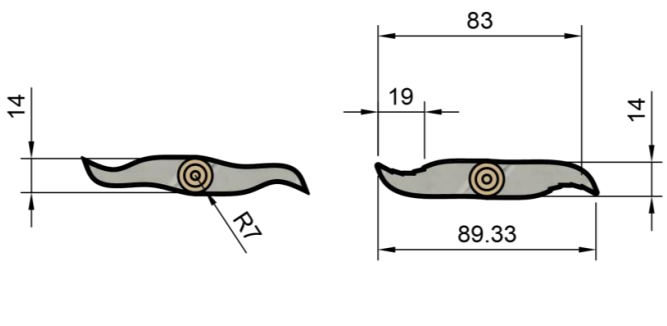


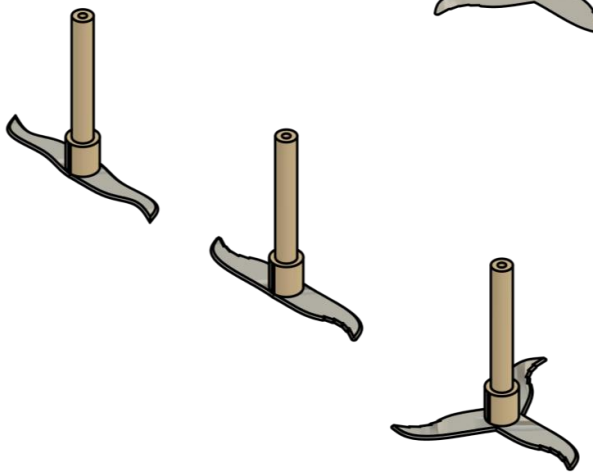


Details



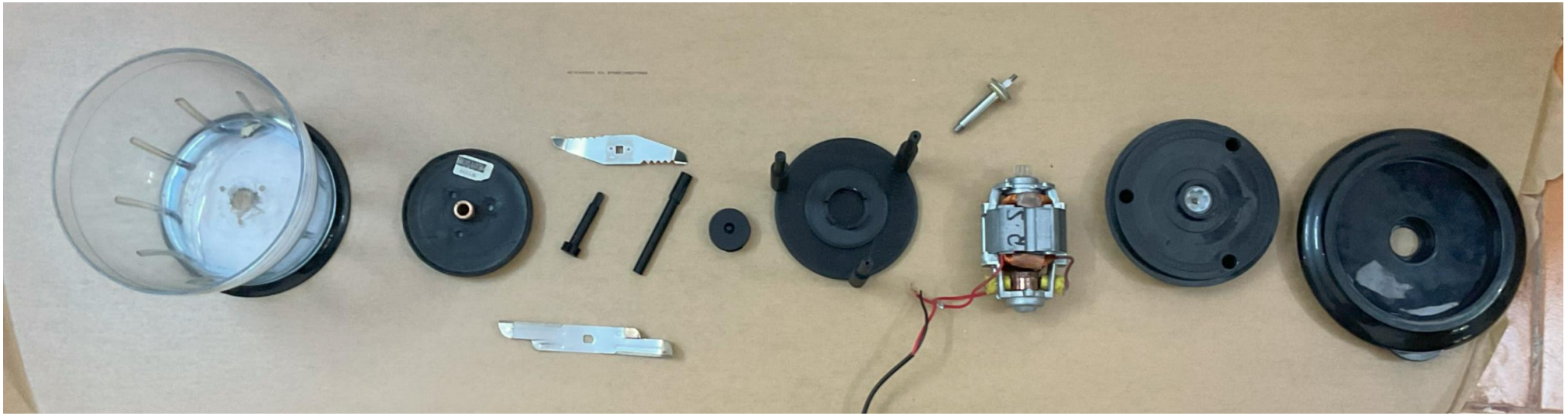






Testing

Testing



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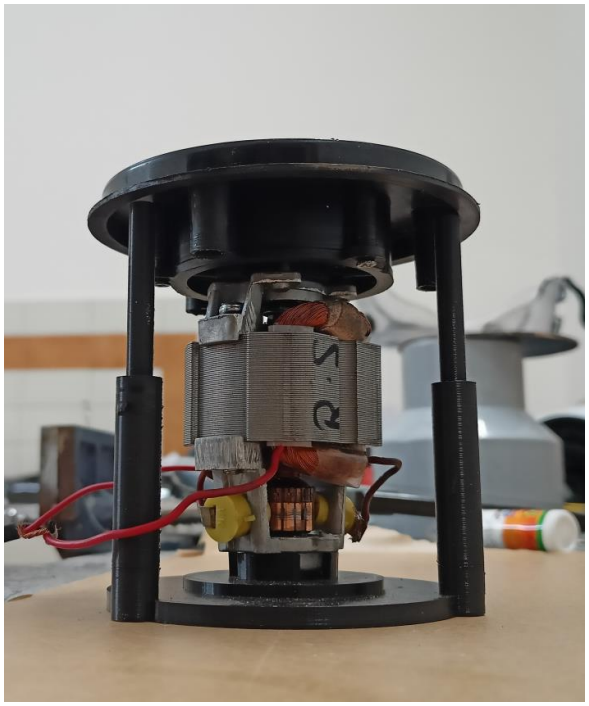
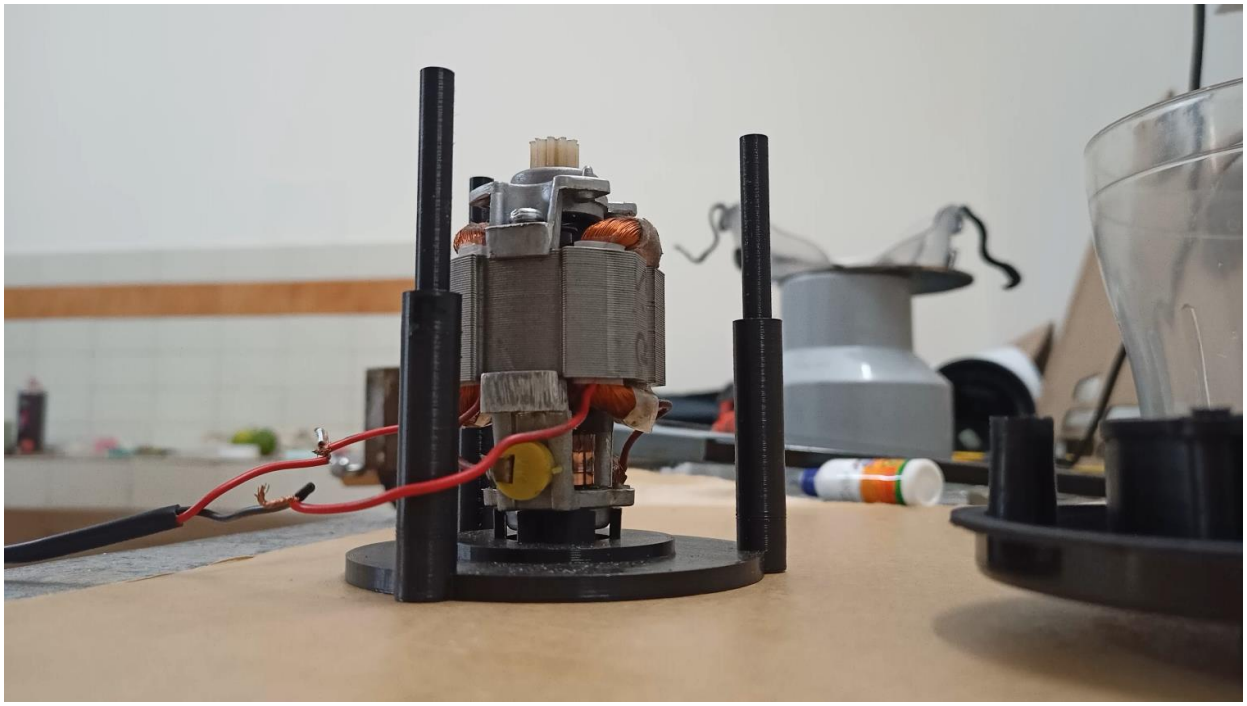
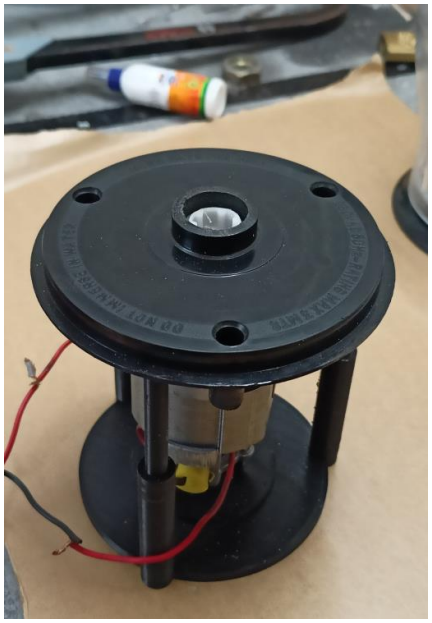
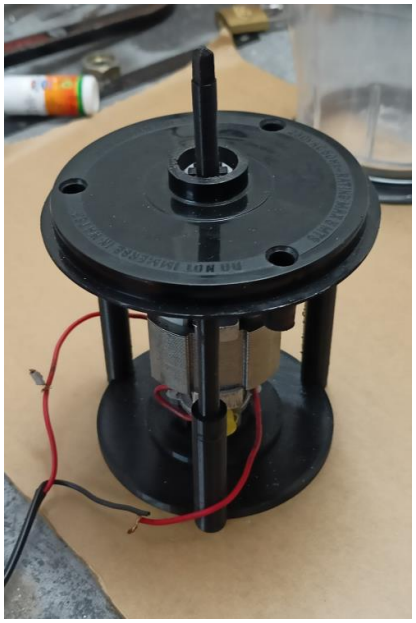




Testing

Testing





Testing

Final Prototype

Business Planning

Real, Win, Worth-it

1. Is there a real market and a real product?	Yes/No/May be
Is there a need?	Yes
Can the customer buy?	Yes
Will the customer buy?	May be
Is there a real product concept?	Yes
Is the product acceptable within the social, legal, and environmental norms?	Yes
Is the concept feasible?	Yes
Will our product satisfy the market?	May be
Can be linked with other products made by the company?	Yes
Can it be produced at low cost?	No
Are the risks perceived by the customer acceptable?	May be

Real, Win, Worth-it

2. Can we win? Can our product/service be competitive?	Yes/No/May be
Do we have a competitive advantage? Is it sustainable?	Yes
Is the timing right?	May be
Does it fit our brand?	Yes
Will we beat our competition?	No
Do we have superior resources?	Yes
Do we have the management that can win?	Yes
Do we know the market as well or better than our competitors?	May be

Real, Win, Worth-it

3. Is it worth doing? Is the return adequate and the risk acceptable?	Yes/No/May be
Will it make money?	Yes
Do we have the resources and the cash to do this?	May be
Are the risks acceptable to us?	Yes
Does it fit our strategy?	Yes

New BOM

Component	Material	Description	Quantity	Amount(Rs)
Motor		250 W AC motor	1	650
Motor housing	HDPE		1	32/kg
Gear Set	HDPE	Attached with the motor housing cover	1	30
Bowl	Glass fibre/ Polycarbonate	Transparent	1	50
Lid	Glass fibre/ Polycarbonate	Transparent	1	30
Shaft	Stainless Steel	Attachment between bowl and base	1	10
Blades	Stainless Steel		2	60
Blade Shaft	HDPE		1	32/kg
Screws			6	10
Washer			3	2
Base Grip	Silicon Rubber		1	50
Motor Holder	ABS		1	50-85

Occasion (Shadi)

On an average 10 MILLION wedding is celebrated in India

Cloud Kitchens

Requires fast Cutting and Chopping

Small Restaurants

Nuclear Families

Dual Income Couples with kids

Foodies & cooking Enthusiasts

Young Professionals

(22-40 yr age group)

Target Market Segments

People with White Collar Job

18.1 million people are involved

Senior Citizen (50yr & above)

Need assistance in cooking and physically demanding

Revenue Projection

Key Assumptions	
Segment Assumption	Nuclear Family Middle Income
% of potential buyers	40%
Penetration Rate	1%
Population growth rate	0.81%
% SAM	30%
Average selling price (ASP)	Rs 1500
Development cost price	Rs 1000

Total Households in India (2010 – 2021, Million) - GlobalData

Direct & Indirect Costs

Middle Income Nuclear Households	Estimated Customers	% of potential buyers	TAM	SAM(30%)	Target market size (50%)	Penetration Rate	Units	Average selling price(Rs)	Revenue (CR)	Direct Cost(800) (CR)	Indirect cost(100) (CR)
Year 1	166320000	40%	66528000	19958400	9979200	1%	99792	1500	**14.9**	7.9	1.9
Year 2	167667192	40%	67066877	20120063	10060032	2%	201201	1500	**30**	16	4
Year 3	169025296	40%	67610119	20283036	10141518	3%	304246	1500	**45.6**	24	6
Year 4	170394401	40%	68157760	20447328	10223664	4%	408947	1500	**61**	32	8

Projected P&L & EBITDA

	Yr1 - Q4	Yr1	Yr2	Yr3	Yr4
Revenues (Rs. Thousands)	149688000	1496880000	301800946	456368300	613419844
Direct Costs (Rs. Thousands)	79833600	79833600	160960504	243396427	327157250
Gross Profit (Rs. Thousands)	69854400	69854400	140840441	212971873	286262594
Gross Profit (%)	47%	47%	47%	47%	47%
Indirect Costs (Overheads) (Rs Thousands)	19958400	19958400	40240126	60849107	81789313
Total Costs (Rs Thousands)	99792000	99792000	201200630	304245533	408946563
EBITDA (Rs Thousands)	49896000	49896000	100600315	152122767	204473281
EBITDA %			33%	33%	33%

Investment Requirement, NPV

	Year 1		Year 2			
	Q3	Q4	Q1	Q2	Q3	Q4
Product 1 Revenue			37422000	42865200	42865200	42865200
Product Development	14968800	14968800				
Production Ramp Up		14968800	14968800			
Marketing and Support	29937600	29937600	29937600	29937600	29937600	29937600
Production cost		14968800	14968800	14968800	14968800	14968800
Period Cash Flow	44906400	74844000	-22453200	-2041200	-2041200	-2041200
PV Year 1, r=30%	-49260960	-69622326	-19429486	-1643086	-1528452	-1421815

Year 3				Year 4			
Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
75450236	86424816	86424816	86424816	114092075	130687286	130687286	130687286
29937600	29937600	29937600	29937600	29937600	29937600	29937600	29937600
14968800	14968800	14968800	14968800	14968800	14968800	14968800	14968800
30543836	34986576	34986576	34986576	69185675	85780886	85780886	85780886
19791231	21088330	19617051	18248420	33568469	38716619	36015459	33502753

Project NPV (Cr)	**7.76**

Thank You