AC1
UX DESIGN RESEARCH & DEVELOPMENT

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REFERENCES

DESIGN RESEARCH

PRIMARY RESEARCH

METHOD 1 - USER QUESTIONNAIRE

A total of 30 questionnaires were completed, canvassing a large cross section of society. Questions included;

- Gender
- Age range
- Favoured type of peeler
- Frequency of use
- Physical impairments
- Purchasing factor
- Design criticisms
- Design recommendations

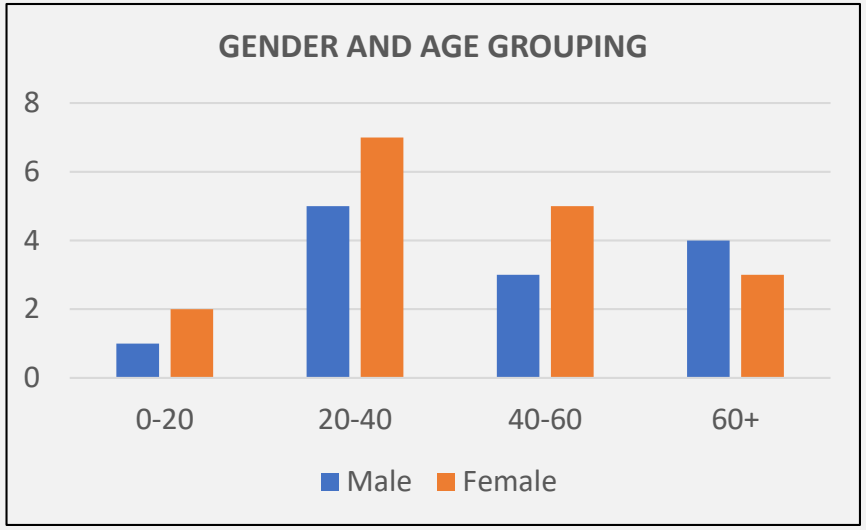
User Experience Questionnaire - Vegetable Peeler

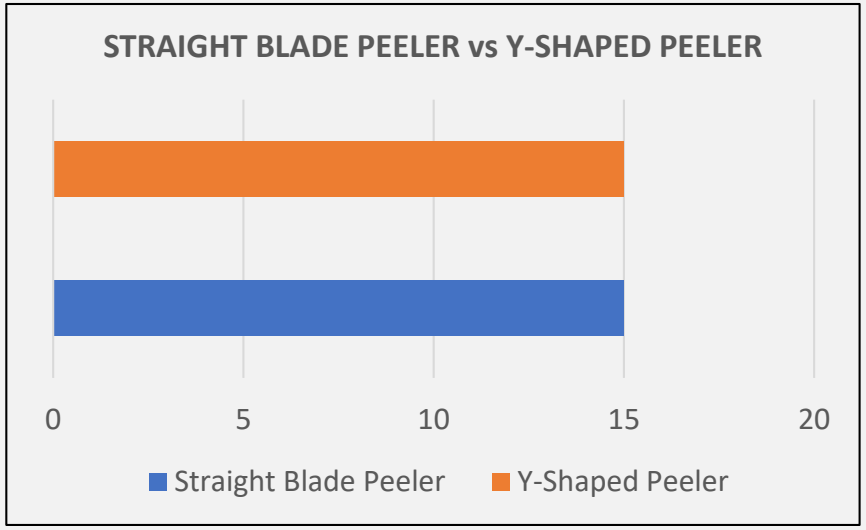
Please circle your answers

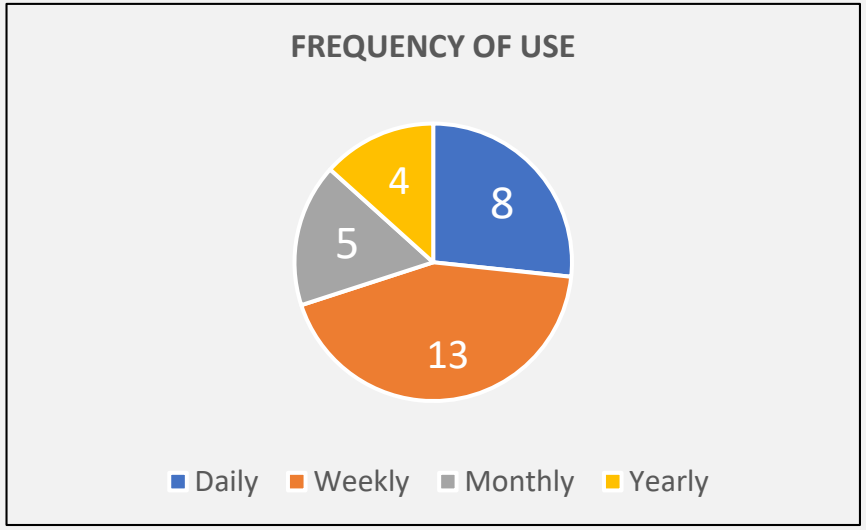
Gender	Male		Female		
Age Range	0 - 20	20 - 40	40 - 60	60+	
What type of vegetable peeler do you most commonly use?	'Straight Blade' Peeler		'Y-Shape' Peeler		
How often do you use a vegetable peeler?	Daily	Weekly	Monthly	Yearly	
Do you suffer with any physical impairments that may hinder your use of a vegetable peeler? (i.e. Osteoarthritis or hand damage due to an accident)	No		Yes		
	If yes, please state;				
What would be the most important factor when purchasing a vegetable peeler?	Price	Brand	Style	Comfort	Reviews
Do you have any design criticisms of your chosen vegetable peeler? (i.e. prolonged use causes your hand to ache, or the blade clogs too often)	No		Yes		
	If yes, please state;				
Do you have any recommendations to the design of your chosen vegetable peeler? (i.e. wider blade, or different material choice)	No		Yes		
	If yes, please state;				

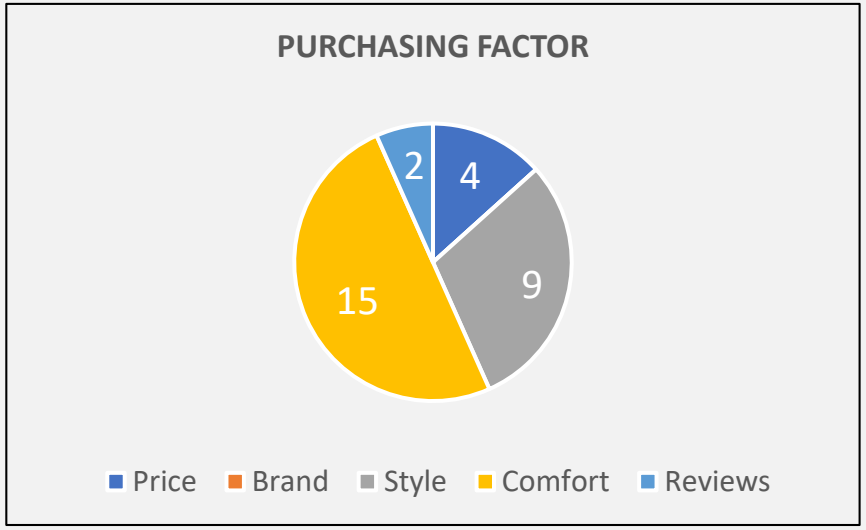
PRIMARY RESEARCH

QUESTIONNAIRE - KEY FINDINGS









PRIMARY RESEARCH

QUESTIONNAIRE - USER CRITIQUE AND RECOMMENDATIONS

CRITIQUE	RECOMMENDATIONS
STRAIGHT BLADE PEELER	
Clogging up	Wider blade
Hand aches	Wider blades
Blade clogs too often	Softer grip
Blade clogs too often	Wider blade
Aching hands	Bigger handle for more grip
Thickness of handles should be variable	Sharper blade
	Smaller, thinner handle for little hands
	Electrical peeler which would be ergonomical and safe
	Comfier handle
Y-SHAPED PEELER	
Handle too short	Longer, fatter handle
Hand aches and blade clogs	Brighter colours
I cut my fingers, and they're hard to use with arthritis	Maybe a wider, thicker handle for me to grip
Hand ache and clogging	Different material
Handles not wide enough	Wider handle made with rubber

PRIMARY RESEARCH

METHOD 2 - OBSERVATIONAL STUDY

STEP 1 - The peeler is removed from the utensil pot
STEP 2 - The user begins peeling, using her thumb for extra support
STEP 3 - This user is left handed
STEP 4 - Once complete, the peeler is rinsed under a cold tap
STEP 5 - It is then placed in the dishwasher for a thorough clean

KEY FINDINGS

- The design must be ambidextrous
- Chosen materials need to be dishwasher safe

PRIMARY RESEARCH

METHOD 3 - USABILITY TESTING

OBJECTIVE

To personally test a range of peelers on vegetables of differing shapes and sizes, paying close scrutiny to their effectiveness and performance. Testing criteria included;

- Time to complete task
- Amount of waste generated
- Aesthetics and material quality
- Level of safety
- Ease of cleaning

KEY FINDINGS

- The ‘Y-Shape’ peeler performed better in terms of usability and time taken to complete the task
- The wider the gap between the cutting edge and main body of the blade reduces the likelihood of the peeler clogging
- Swivelling blades better follow the contours of the vegetable and reduce the need for hand re-adjustments
- Whether pulling toward or pushing away from the body, ‘Straight Blade’ peelers are inherently more dangerous as your digits are exposed to being cut if the blade slips

Fig.1

Fig.2

Fig.3

PRIMARY RESEARCH

METHOD 4 - EMPATHY MODELLING

Fig.4

Fig.5

Fig.6

Fig.7

OBJECTIVE

The aim of this task was to test peeler usability whilst mimicking common hand impairments such as Osteoarthritis [Fig.4] and Hypoesthesia [Fig.7], with the intention of gaining a greater understanding of such illnesses and the impact they have on simple tasks - for example, due to restricted joint movement [Fig.5]. With these simulated impairments in place, testing assessed the following;

- Handle - grip, shape and form
- Material - weight and surface finish
- Blade position - degree of freedom
- Safety - grip force and stability

KEY FINDINGS

- Flat handles are considerably more difficult to hold with impaired joint movement, placing excess pressure on the users index finger and thumb [Fig.6]
- Textured ‘non-slip’ surface finishes aid grip when sense of touch is impaired - particularly when wet

SECONDARY RESEARCH
EXISTING PRODUCTS

DESIGN CLASSICS

The following are four iconic peeler designs that were innovative for their time and inspired many of the products of today;

Fig.8

The Lancashire Peeler
United Kingdom, c.1800s
Innovation; A string wrapped handle for improved grip and comfort (Wikipedia contributors, 2018)

Fig.9

L'Econome
France, 1928
Innovation; A unique blade design that features two slits (Neel-Farina, 2010)

Fig.10

The Jonas Peeler
Sweden, 1953
Innovation; A pivoting blade that self adjusts as pressure is applied, increasing ease of use (Wikipedia contributors, 2018)

Fig.11

Zena Rex Peeler
Switzerland, 1947
Innovation; A hardened and blued steel blade made it one of the sharpest on the market ("REX - The Original", 2013)

THE 'BEST' PEELERS 2018

In October 2018, Natalie Hardwick of "BBC Good Food" carried out a review of 14 leading vegetable peelers, taking into consideration grip, speed, thickness of blade, weight and ease of use. The peelers were matched against a range of fruit and vegetables including potatoes, tomatoes, peppers and citrus fruits. The results were as follows;

Best Innovation: *Kyocera rotating head ceramic peeler* [Fig.12]
"We were primarily looking for simple peelers, but this straight peeler with a rotating head is worth a mention. Ceramic blades are a good choice as they stay sharper for longer and don't rust, and this efficient blade was particularly good when paring zest. The turning handle makes the peeler suitable for both left and right-handed cooks" [Hardwick, 2018]

Best Straight Peeler: *OXO Good Grips swivel peeler* [Fig.13]
"This remarkably well-priced peeler has it all - a sharp blade, effective motion and a very comfy ridged handle (hence the name Good Grips, we surmise). It's non-slip even when wet and it feels like it'll stand the test of time. Straight peelers are also very easy to store, and this one has an added eye-remover for potatoes" [Hardwick, 2018]

Best Shape: *Stellar Soft Touch y-shaped peeler* [Fig.14]
"*This peeler has great dimensions, with a nice long handle and a wide blade. The rubber coating gives it a comfortable grip and it created the best ribbons of the lot. We think there's only so far you can go when it comes to making peelers attractive - but if you're looking for something chic, the copper colour is a nice added bonus*" [Hardwick, 2018]

Fig.12

Fig.13

Fig.14

SECONDARY RESEARCH
PHYSICAL IMPAIRMENTS

HAND AND ARM IMPAIRMENTS

Condition	Relevant Symptoms
Rheumatoid and Osteoarthritis	- Joint pain, stiffness and tenderness - Increased pain and stiffness following inactivity - Limited range of movement in your joints - Weakness and muscle wasting (National Health Service, 2016)
Motor Disabilities (Parkinsons disease, MND, MS etc.)	- Involuntary hand and arm movements - Muscle stiffness and reduced grip - Numbness and weakness (WebAIM, 2014)
Tendonitis	- Pain in tendon (for example, in elbow or shoulder) - Difficulty moving the affected area (National Health Service, 2017)
Carpal tunnel syndrome	- Ache or pain in your fingers, hand or arm - Numb hands, tingling or pins and needles - A weak thumb or difficulty gripping (National Health Service, 2018)
Hypoesthesia	- Reduced sense of touch and numbness (Li-Feng et al., 2014)
Trauma (spinal cord damage, fractured bones, lacerations etc.)	- Reduced movement - Pain, stiffness and numbness (WebAIM, 2014)

ASSISTIVE AIDS

A range of assistive aids have been developed to help lessen the impact of physical impairment. Typically these aids employ a large handle made with sympathetic material choices that aid grip and are softer upon the hand [Fig.15]. Also, a more radical design exists in the form of the “EZ Vegetable Peeler” [Fig.16]. This device hooks upon the middle finger and sits flat in the users palm, removing the need to clench their fist

Fig.15

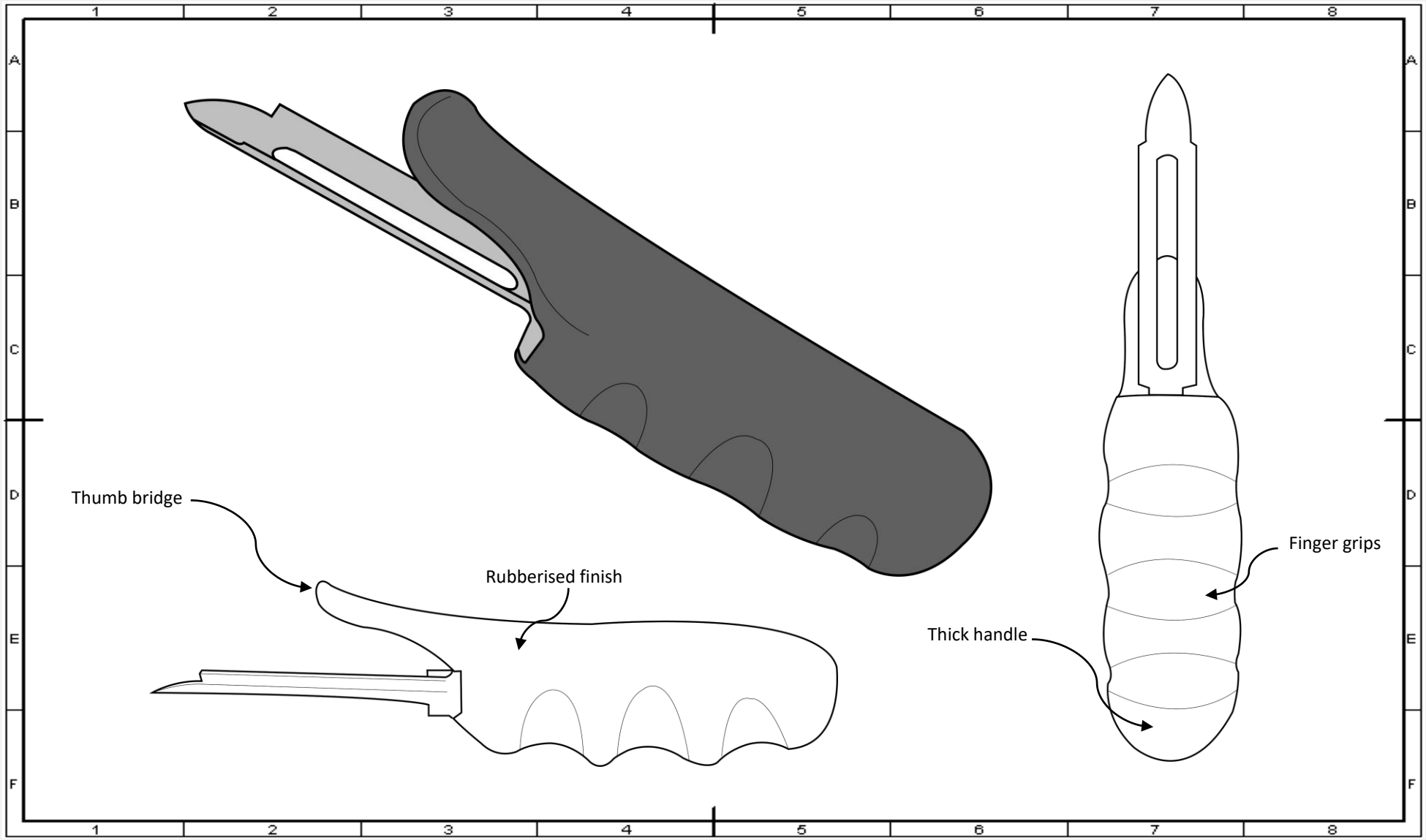
Fig.16

However, design adaptions aren’t limited to ergonomic form factors - electrical assistance is also utilised. One such product is the “Zyliss Multipeeler”, which helps peel via a reciprocating blade that reduces the physical pressure that needs to be placed upon the target fruit or vegetable, lessening the strain on fragile and painful joints. A demonstration of this device in action can be found in the following video;

Vid.1

DESIGN DEVELOPMENT

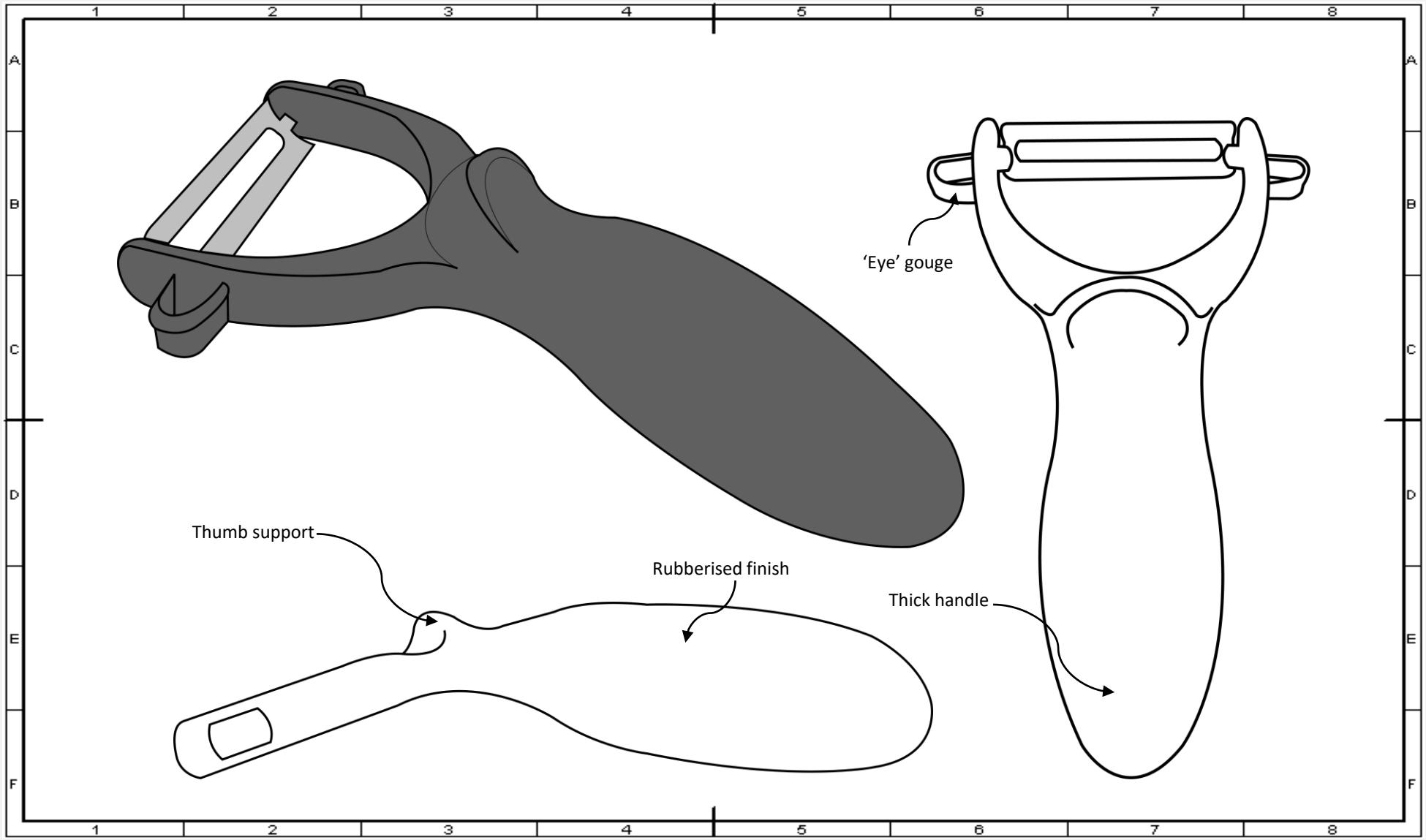
CONCEPT TYPE A



CONCEPT TYPE A - PROTOTYPE

Concept Type A was based upon a model of Peeler Type A. The handle was heavily reformed using ‘Polymorph’ thermoplastic pellets to create a thicker, more ergonomic handle with integrated thumb bridge and finger grips. The prototype was then finished with three coats of ‘Plasti-Dip’ rubberised paint for increased grip and tactility

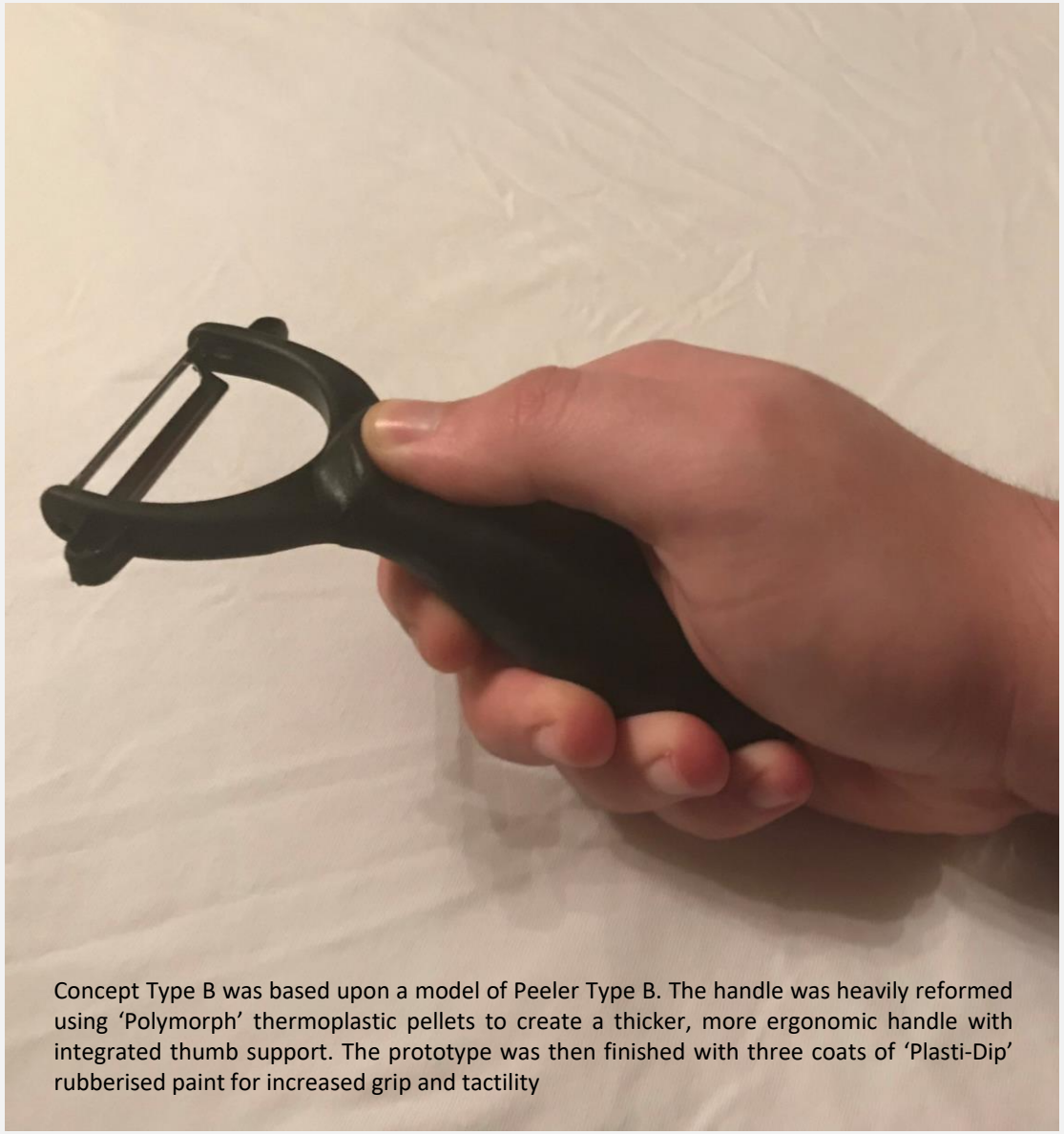
CONCEPT TYPE B



CONCEPT TYPE B - PROTOTYPE

Peeler Type B

Concept Type B



Concept Type B was based upon a model of Peeler Type B. The handle was heavily reformed using ‘Polymorph’ thermoplastic pellets to create a thicker, more ergonomic handle with integrated thumb support. The prototype was then finished with three coats of ‘Plasti-Dip’ rubberised paint for increased grip and tactility

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Videos:

Vid.1: [Online] Available at: https://www.youtube.com/watch?v=oGWMoqmHH9s (Accessed: 03 November 2018)