IDC
IIT Bombay

Project III

Customized Vlogging Kit for YouTube Content Creators

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01. Design Methodology

Introduction

Introduction to the scenario and describing the need for the product.

Justifying the choice of topic

Reason for choosing the topic
And defining how the product can benefit the users

Research

Secondary research

Collecting information from the internet regarding the problems caused and how people are affected

Primary research

Collecting information directly from the users to understand the situation and their problems better

Market study

Understand the existing products, their functionality, limitations , material used, manufacturing etc.

Design Brief

Defining the aim of the project

Field visit

Visiting users to understand their working environment and analyze their problems

User Interviews

Preparing questionnaires, analyzing the responses taking photographs, studying their equipment, understanding the users needs better.

Ideation and conceptualizations

Sketching

Initial scribblings
Developing and detailing the ideas

Developing different concepts

Taking different design directions, creating concept ideations and narrowing it down.

Making Mock ups

Masking rough mock ups and testing it out with the users to understand workability of the design and add new features if required

Doing further research to find out any possible and viable design to minimize complexities and redefine brief if required.

Rendering, prototyping and testing

Finalizing the concept after concept evaluation and making CAD models.

Final Prototype

Making final prototype to prove the functionality and test it out with the users and make any interventions if any.

Product renderings, animations and recording the data

Testing

Testing the product made with actual users and taking feedback from them to improve the design if necessary in the future

02. Introduction

YouTube

YouTube is a free video-sharing website that simplifies the process of watching online videos. You can also create your own videos and share them with others to watch. With over 6 billion hours of video seen each month, YouTube, which was started in 2005, is now one of the most popular websites on the Internet.

One of the reasons YouTube is so popular is the sheer number of videos available. On average, YouTube receives 100 hours of video per minute, so there's always something new to watch.

YouTuber

A YouTuber is a person who creates videos on the video-sharing network YouTube, specifically on one or more YouTube channels, which are customizable subpages of the platform. In the year 2006, the term was first used in the English language.

Steve Chen, Chad Hurley, and Jawed Karim developed YouTube. The trio were all early workers of PayPal, which benefitted them once eBay purchased the company. Hurley had majored in design at Indiana University of Pennsylvania, and Chen and Karim had majored in computer science at the University of Illinois at Urbana–Champaign.

Steve Chen

Chad Hurley

Jawed Karim

Fig 1 . YouTube Founders

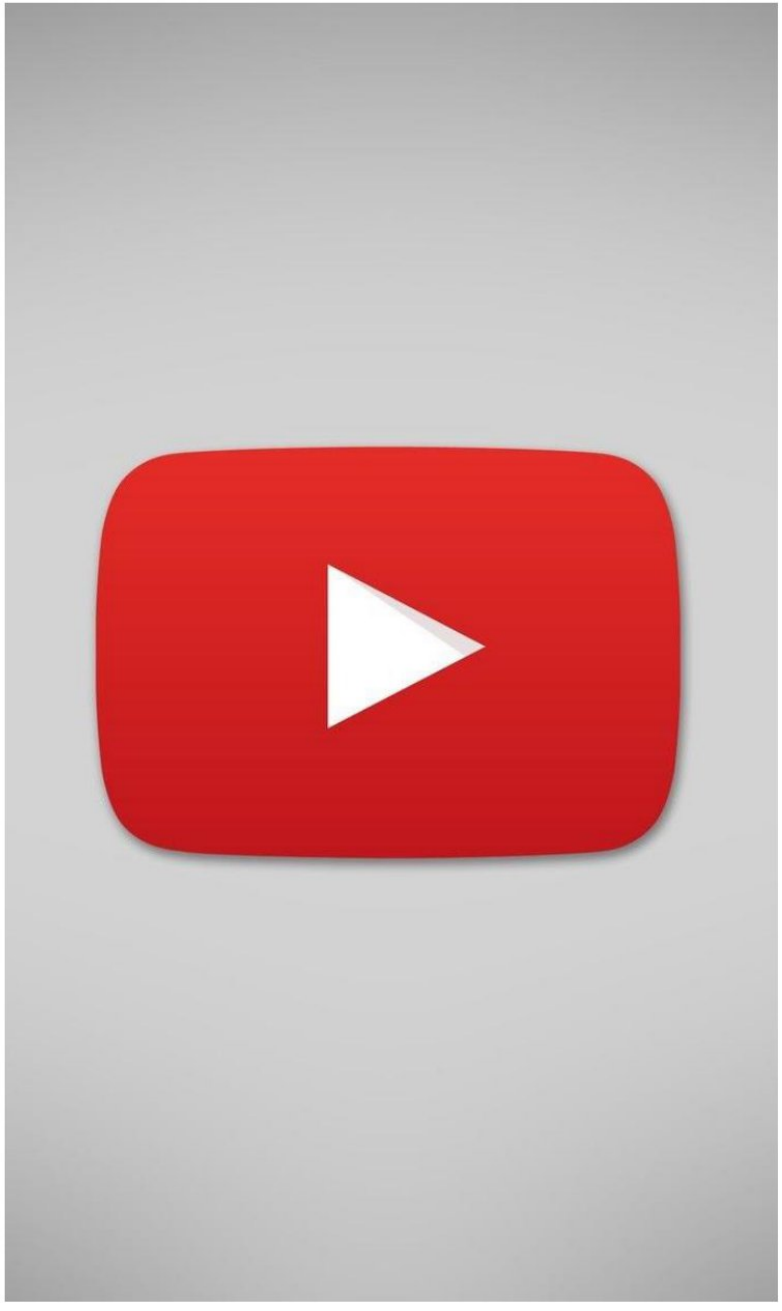


Fig 2 . YouTube logo

03. Secondary Research

3.1 Impact of YouTube on Digital Era

- **Social Media's Second-Most-Popular Platform**

YouTube is the second most popular social media network behind Facebook. YouTube is used by approximately 79 percent of internet users worldwide (Dataeportal, 2019).YouTube has a lot of benefits for users all around the world, whether they're looking for music to listen to, product reviews, movie trailers, covers, or learning.YouTube has expanded consistently and tremendously since Google acquired it from its founding PayPal workers, one of the reasons being its ease of accessibility. The shocks don't seem to stop even today, with the advent of YouTube Red and YouTube music.

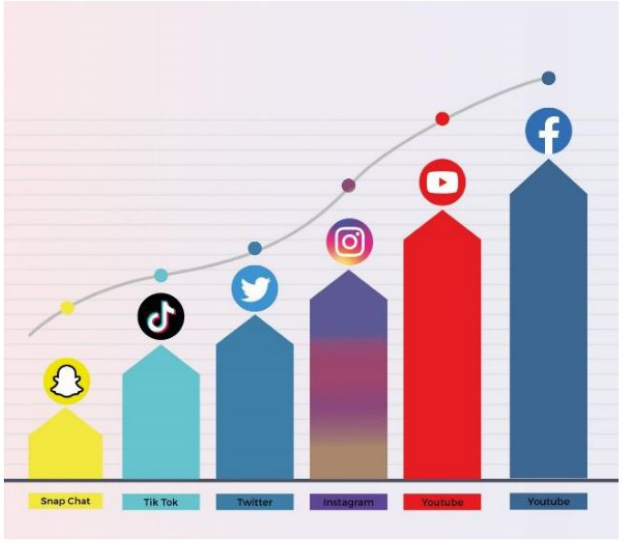


Fig 3 . Infographic 1

- **The Second-Most-Used Search Engine**

It is not only the second most popular social media platform in the globe, but it is also the second most popular search engine behind Google. It has a daily audience of over 1,300,000,000 people and one billion user hours!YouTube, it appears, has answers to all of your questions. It's the most popular way to find "How To" videos all over the world.

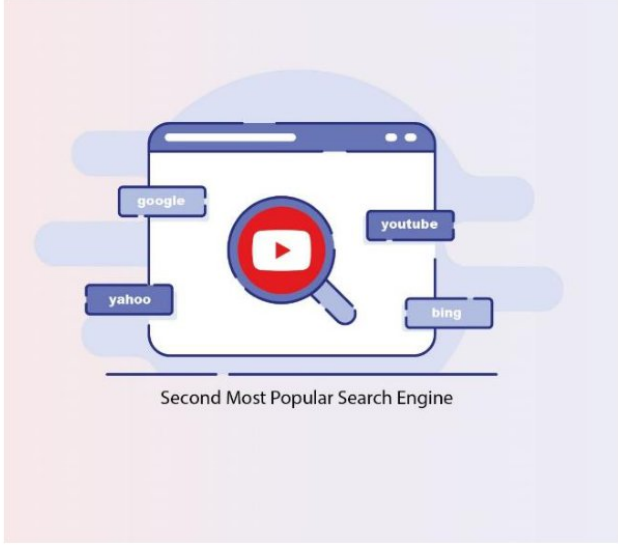


Fig 4 . Infographic 2

- **Business tool**

Because video content is preferred over plain text, a rising number of businesses and brands are using YouTube to market and promote their products and services, either directly through their channels or through YouTube content creators. Because of the platform's global reach, it's a wonderful way to communicate with current customers and attract new ones.

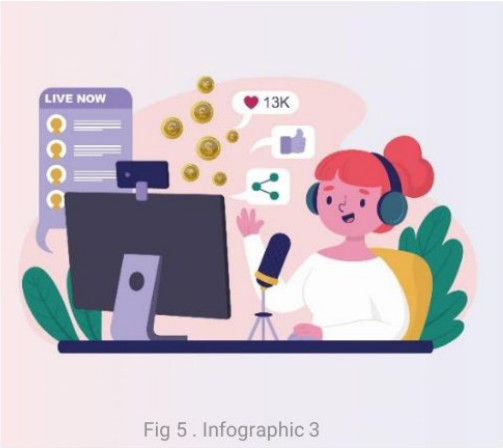


Fig 5 . Infographic 3

- **Assists Users in Finding New Products**

90 percent of viewers say YouTube introduces them to new items and businesses (Thinkwithgoogle, 2019). While it may not result in a specific purchase, it certainly gets the ball rolling. Because consumers rely on video content more than anything else, YouTube may expose your business to an unparalleled amount of potential customers.

Fig 6 . Infographic 4

- **Upskilling and learning**

YouTube is a popular learning resource for people all around the world. YouTube has the solution to everything, whether it's academics, learning skills like playing musical instruments, cooking, learning how to code, draw, design, or even how to workout. Video tutorials and guides are preferred by users over text since they are easier to understand when seen in action.

Fig 7 . Infographic 5

- **6) Global Presence**

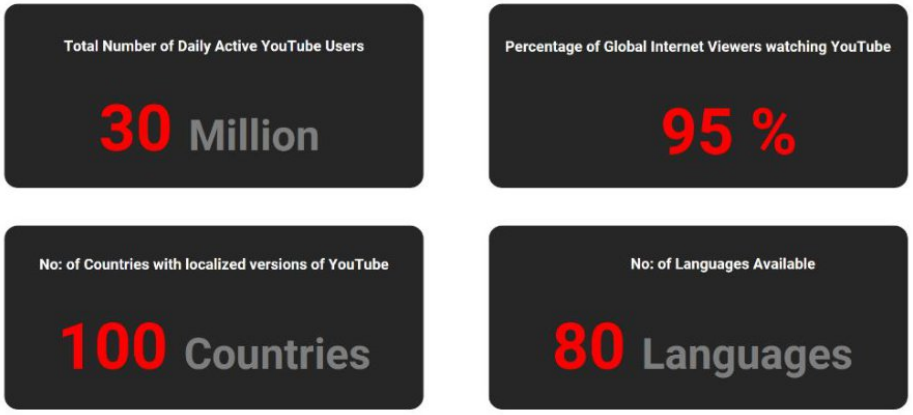
- One of YouTube's most notable benefits, particularly for corporations, is its global reach. Even if you only speak one language, you can possibly communicate with millions of individuals all around the world. Plus, there's more. Closed captioning increases viewership by making your content more accessible.

Fig 8 infographic 6.

3.2 Statistics

YouTube users

The following is a user data of the number of YouTube users across the world



User engagement

The data shows the YouTube user engagement calculated in hours.

YouTube users across the World

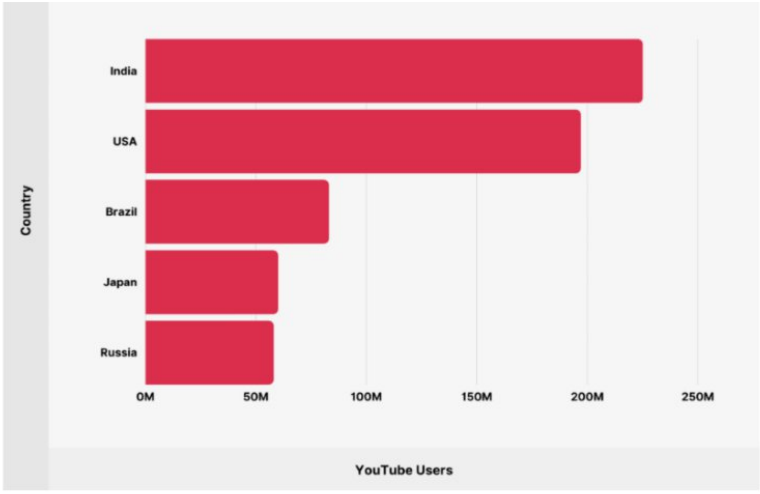


Fig 9 . Country graph

YouTube usage Growth

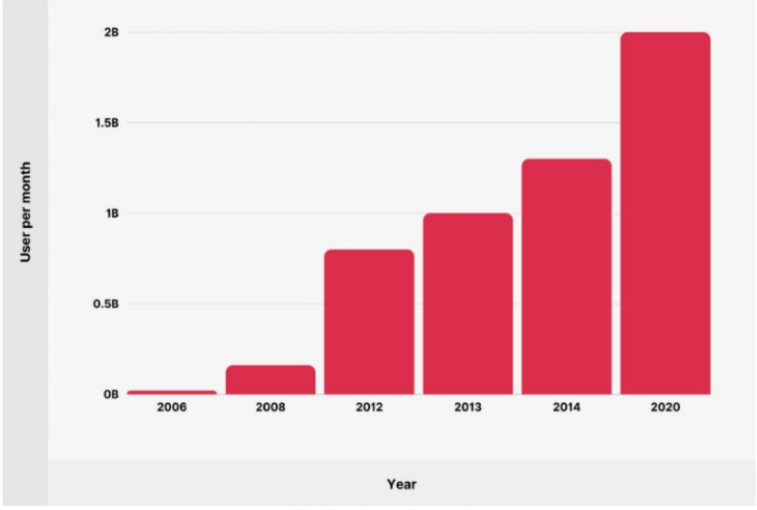


Fig 10. Growth graph

Most used social media platforms

The following graph shows the user count of the famous social media platforms across the world

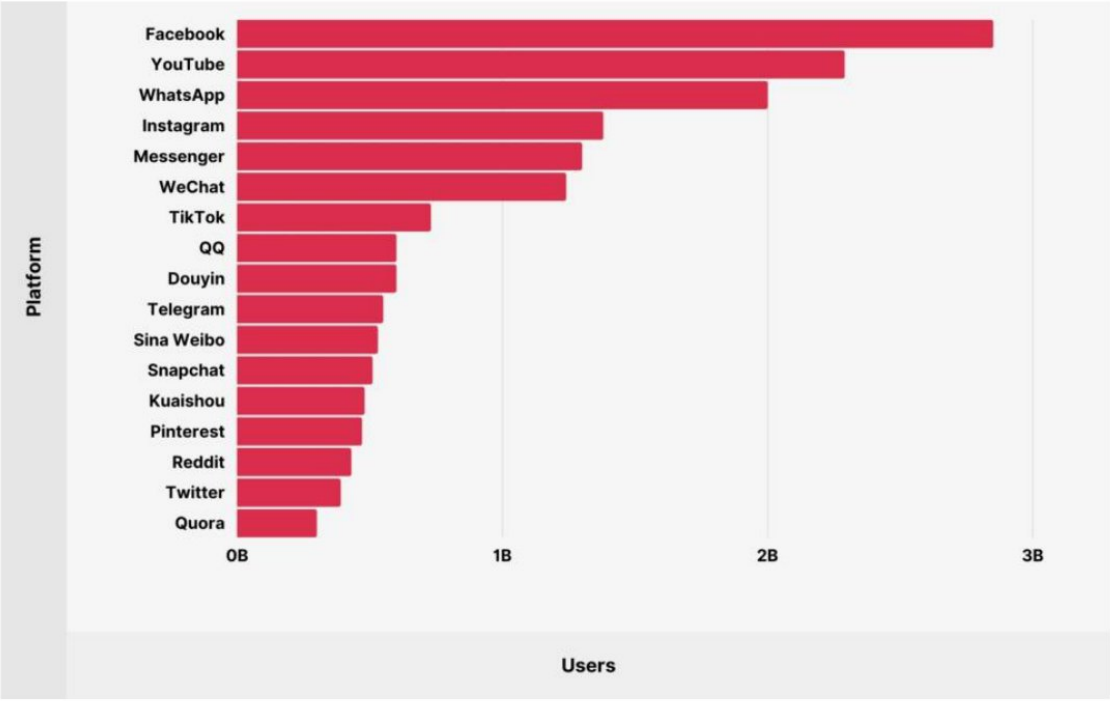


Fig 11 . Platform graph

User Percentage by Gender

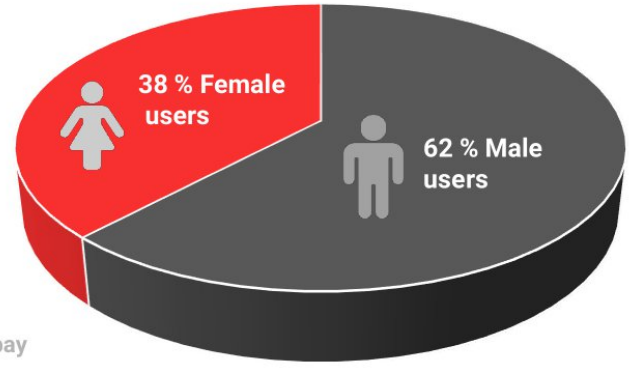
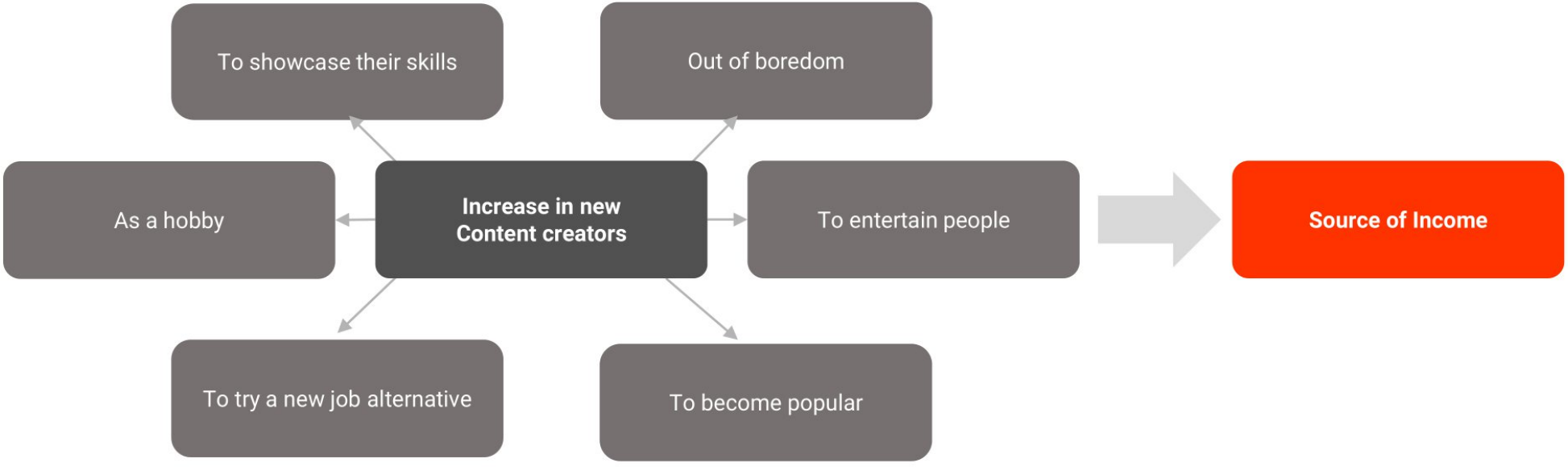


Fig 12. Gender pie chart

3.3 Effect of Pandemic

People started spending more time at home - **Social media usage** increased

- Viewers count increased
- Content creators count increased



3.4 Reasons why people wish to be a YouTube Content Creator

Popularity

- It provides them a unique identity in the society
- People get a chance to Influence people and gain followers
- They have an opportunity to entertain people
- An opportunity for sharing Knowledge

Source of Income

YouTube can be an extra source of income to the creators. The payment depends upon the following factors –

- Number of subscribers
- Number of watch hours
- Quality of videos
- Brand Promotions

Happiness and Self Satisfaction

- Seeing the viewers enjoying and appreciating the videos gives a feeling of happiness to the creators

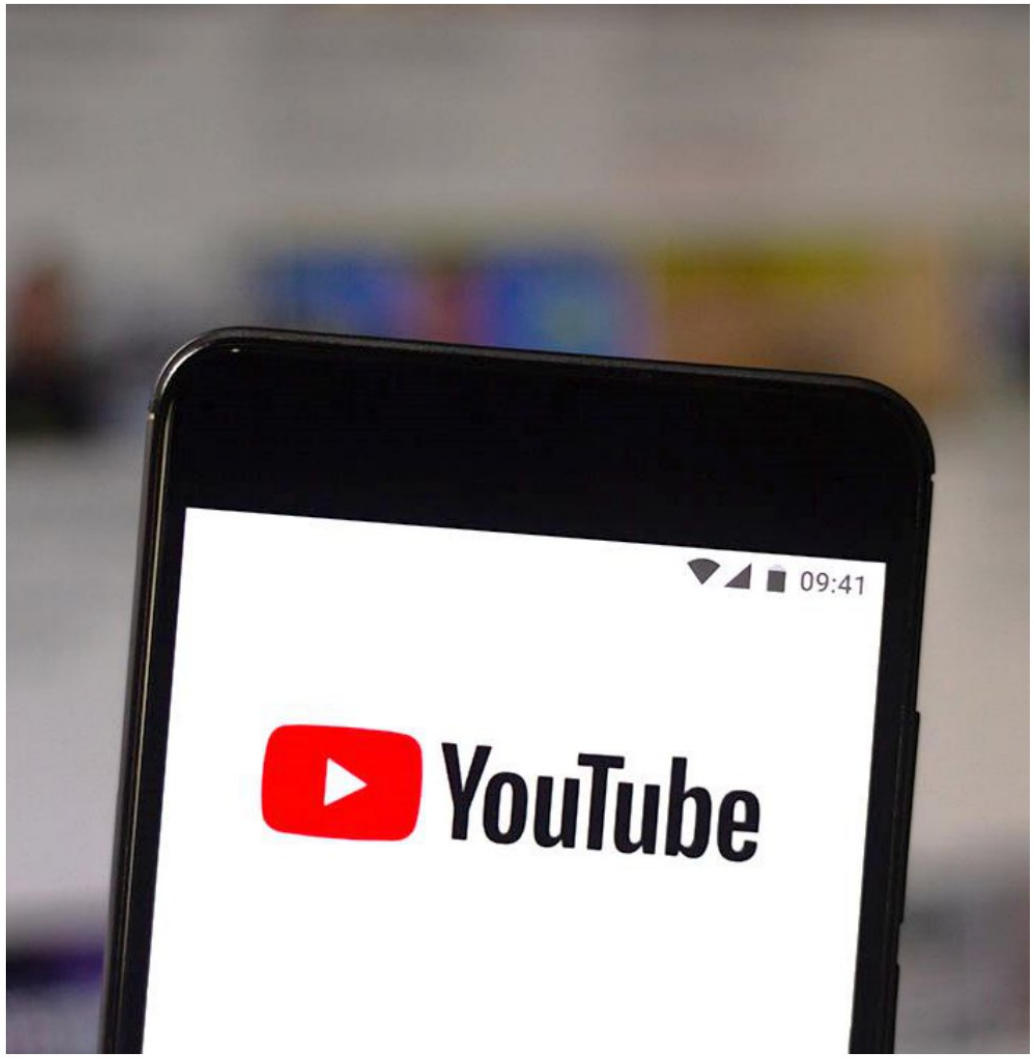


Fig 13 . YouTube icon 1

https://www.semrush.com/blog/youtub

3.5 Cons of being a YouTube Content Creator

Privacy issues

- People can lose their freedom while travelling or being in public places as viewers gather around them asking for photos or selfies.

Instability as a career

- Choosing content creation as a career is a risky step.

Burden of creating Contents

- Need to constantly find and generate new contents for revenue generation.

Initial expenses on buying equipment

- The minimal equipment required for creating a good video content may not be affordable for everyone.

Fig 14 . YouTube logo

/www.globalmediainsight.com/blog/youtube-users-statistics/

3.6 Method of earnings for Content Creators

Monetization

Content creators can apply for video monetisation once their channel reaches 1000 subscribers and exceeds 4000 watch hours YouTube after verification, starts their payment proceedings according to the reach of their videos.

1000 Subscribers

4000 Watch hours

Apart from monetization, there are few other ways in which the creators and make money from YouTube. They are -

Google ads

Advertisers pay based on clicks and impressions.
YouTube gives the **content creator 55%** of this revenue and **takes 45% for itself.**

Brand Sponsorship

A company will pay a content creator to **promote a brand or product** within a video

Fan funding

Fans and followers make recurring **monthly payments** in exchange for bonus content such as **badges, emojis, special videos, live chats, and other content**

Merchandise Sales

YouTube partners also have the ability **to sell up to 12 items** of merchandise to their audience by enabling this feature in their accounts.

3.7 YouTube Creator Awards

To encourage the creators to contribute more content, YouTube gives creator awards to the creators according to their subscriber count. They are usually made in the form of Play Buttons. They give -

- **Silver** Play button - for **1 Lakh Subscribers**
- **Golden** Play Button – for **1 Million Subscribers**
- **Diamond** Play Button – for **10 Million Subscribers**

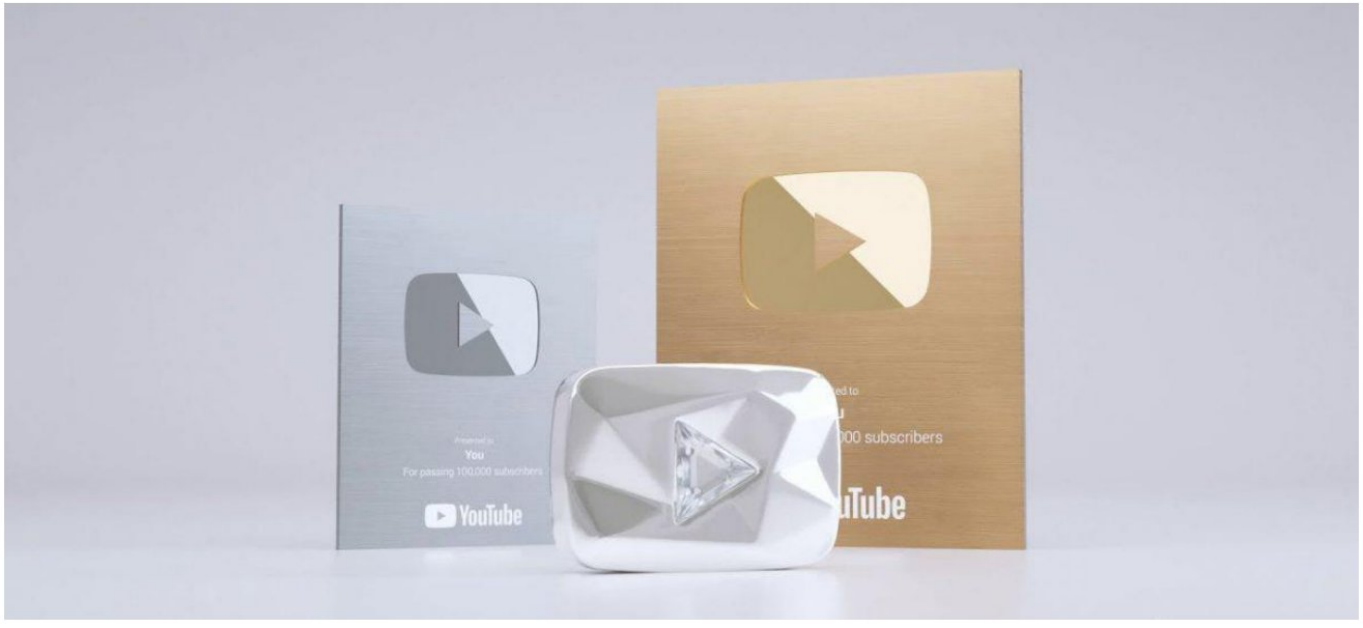


Fig 15 . YouTube awards

Fig 16 . Customize awards

In addition to this , they give customized Play Buttons for very famous content creators who manage to touch the mark of 50 Million subscribers. They may even customize it according to the users logo to make it more special and valuable. The creators get a sense of achievement form these.

3.8 Famous YouTubers in the World

Following are some of the most successful You tubers in the world form different content areas and who have managed to gather a lot of subscribers all over the world and are earning in millions.

Fig 17 . YouTuber 1

Felix Arvid Ulf Kjellberg

Channel Name – PweDiePie

Subscriber count - 111 Million

Content - Gaming Videos

Net worth - $ 54 M = ₹ 400 cr +

Fig 2 . YouTube logo

Fig 18 . YouTuber 2

Jimmy Donaldson

Channel Name – MrBeast

Subscriber count - 88.9 Million

Content - Comedy Videos

Net worth - $ 54 M = ₹ 400 cr +

Fig 19 . YouTuber 3

Anastasia Radzinskaya

Channel Name - Like Nastya

Subsriber count – 86.1 Million

Content - Day to day activities

Net worth - $20 M = ₹ 150 cr +

3.9 Famous YouTubers in India

Following are some of the most successful You tubers in India form different content areas and who have managed to gather a lot of subscribers.

Fig 20 . YouTuber 4

Ajey Nagar

Channel Name - Carryminati

Subscriber count - 34.4 Million

Content – Comedy and Roasting videos

Net worth - ₹ 30 cr 65 lkhs

Fig 21 . YouTuber 5

Nisha Madhulika

Channel Name - **Nisha Madhulika**

Subscriber count – 12.3 Million

Content – Cooking and Recipe

Net worth - ₹ 20 cr 65 lkhs

Fig 22 . YouTuber 6

Harun Robert

Channel Name - **Mad Stuff with Rob**

Subscriber count – 2.43 Million

Content – Art and Craft

Net worth - ₹ 7 cr 51 lkhs

3.10 Influence of YouTubers on the Product Design Industry

YouTube has become a major source of tech information for a user who is planning to buy a new gadget. There are a lot of channels which help them with their reviews as well and help the users to choose the correct product according to their requirements.

Some tech review channels like Unbox Therapy and Marques Brownlee have become so influential that their good reviews can shoot up a companies production to a great extent. So the companies, before launching a new product in the market, send it to such tech reviewers and pay them for reviewing their products. In this way the content creators and the companies get a mutual benefit form each other for their growth.

Fig 23 . YouTuber 7

Unbox Therapy

Fig 24 . YouTuber 8

Marques Brownlee

3.11 Types of YouTube Channels and their Requirements

3.11.1 Beauty and Fashion Vloggers

Beauty and Fashion YouTubers are well known for their expertise on the subjects of makeup and skincare. As trendsetters within the beauty industry, they often set a precedent for what brands and products will be most popular.

YouTubers that fit within the fashion category specialize in clothing and accessories. The most successful come to the platform with a strong sense of style and an eye for upcoming trends.

Recording space – Indoor

Camera angles – 1 or 2

Requirements

- **Video Recording Device –** Mobile or camera
- **Audio Recording Device –** Microphone
- **Device holder -** Tripod
- **Lighting** – Ring light [preferred]
- **Other materials required –** Beauty and make up kits , Outfits

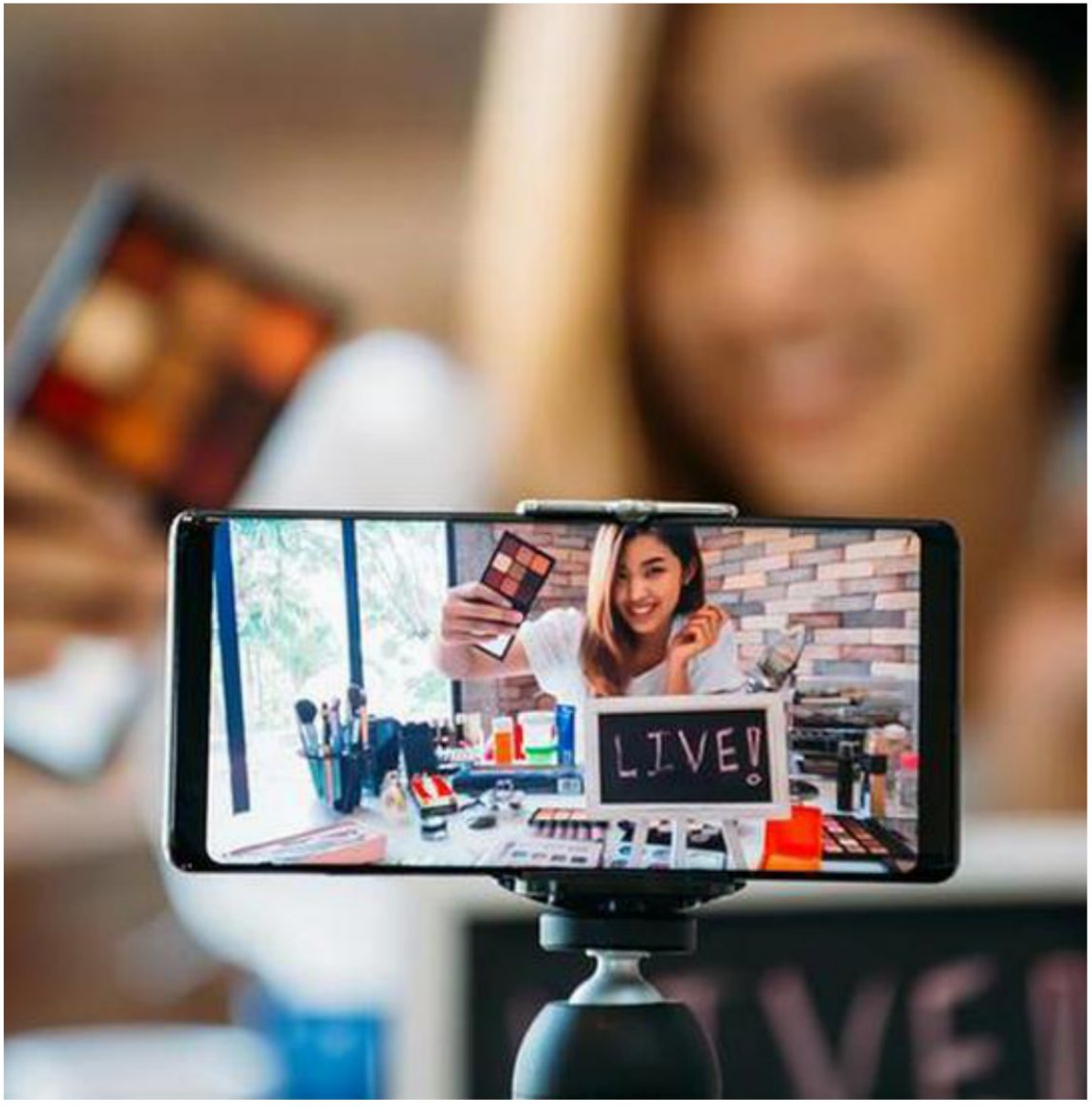


Fig 25 . Beauty Vloggers

3.11.2. ASMR Videos

[Autonomous Sensory Meridian Response]

ASMR refers to the soothing sensation felt when someone brushes their fingertips lightly over your skin or whispers softly in your ear. YouTubers with ASMR channels cover various topics and can even combine their topics with other niches like make-up and how-to. The main attraction, however, is the soothing sounds & imagery used by these YouTubers to relax their viewers.

Recording space – Mainly indoor

Camera angles – 1 or 2

Requirements

- **Video Recording Device -** High resolution video camera (Often capable of slow motion recording)
- **Audio Recording Device –** HD microphone
- **Device holder -** Tripod
- **Lighting** – Studio lighting
- **Other materials required –** Random everyday objects

Fig 26 . ASMR videos

3.11.3 Comedy / Pranks / Skit Videos]

YouTubers specializing in comedy are known for poking fun at everyday human problems, creating original skits and characters, and publishing content intended to make people laugh.

Recording space – Indoor and Outdoor

Camera angles – Multiple

Requirements

- **Video Recording Device –** Camera and Mobile
- **Audio Recording Device –** Collar mics

- **Device holder -**

Tripod - No : depends on the type of videos
Gimbal
Drones

- **Lighting** – Natural or Studio lighting

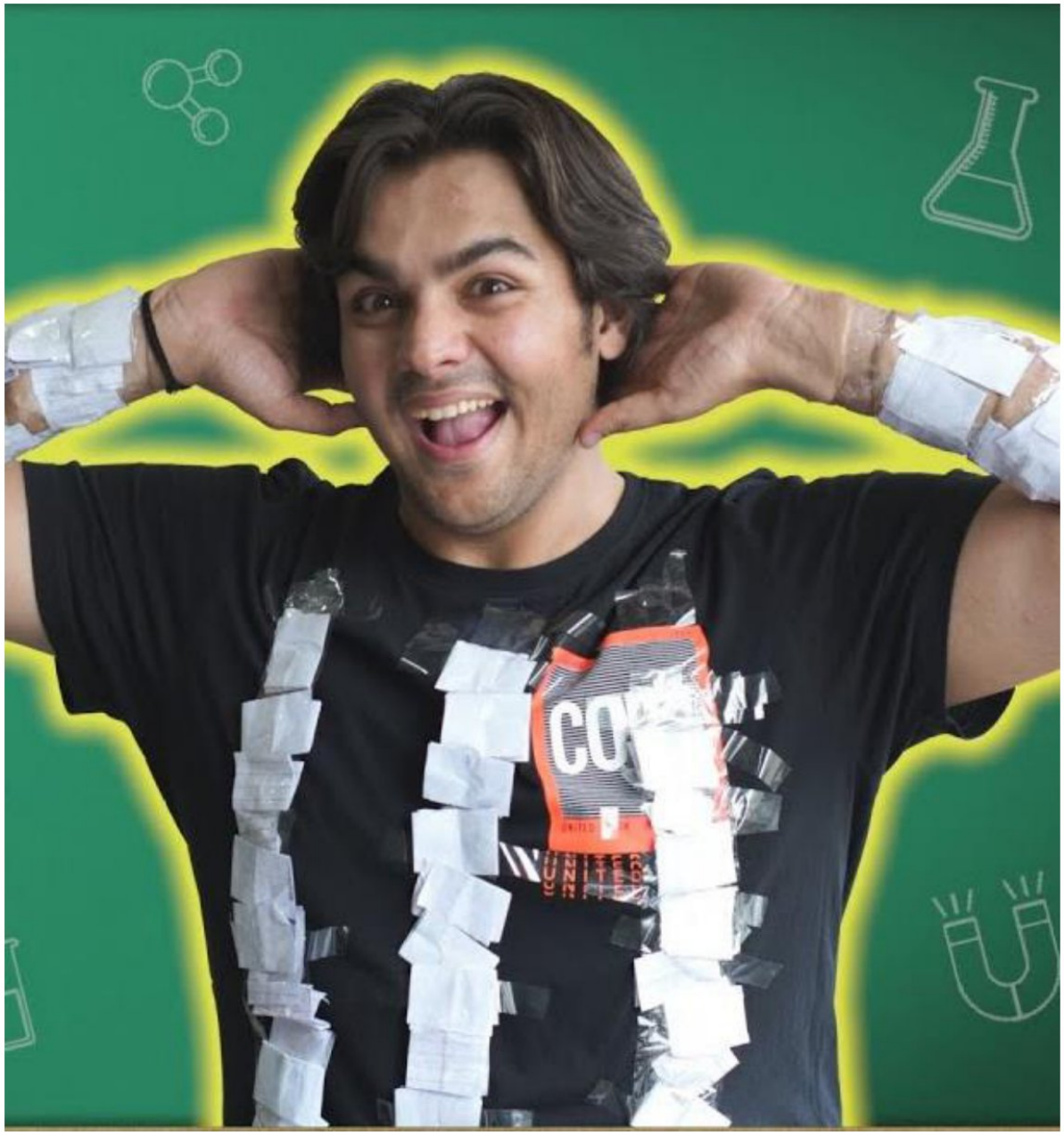


Fig 27 . Comedy Vlogger

3.11.4 Daily Vloggers

Daily vloggers are some of the most consistent creators on YouTube, publishing a video every day..

Recording space – Indoor and Outdoor

Camera angles – 1

Requirements

- **Video Recording Device –** Mobile
- **Audio Recording Device –** Mobile , Headset
- **Device holder** - Handheld / Gimbal / Selfie stick
- **Lighting** – Natural light

Fig 28 . Daily vloffers

3.11.5 Cooking and Recipe Videos

For cooking connoisseurs and those just learning to cook, cooking YouTubers are an excellent source for new recipes. This type of YouTuber teaches viewers how to prepare meals through guided tutorials.

Recording space – Indoor

Camera angles – 2

Requirements

- **Video Recording Device –** Camera / Mobile
- **Audio Recording Device –** Collar mic / Headset
- **Device holder -** Tripod
- **Lighting** – Studio lighting

Fig 29 . Cooking vloggers

3.11.6 Art and Craft Videos

Design/art YouTubers are those who create videos showcasing their art expertise and help others to improve their artistic skills. Creators within the group explore many different mediums, including traditional drawing, digital drawing, graphic design, and painting.

Recording space – Indoor

Camera angles – 2

Requirements

- **Video Recording Device –** Camera / Mobile
- **Audio Recording Device –** Mobile / Microphone / Headset
- **Device holder -** Tripod
- **Lighting** – Natural or Ring light

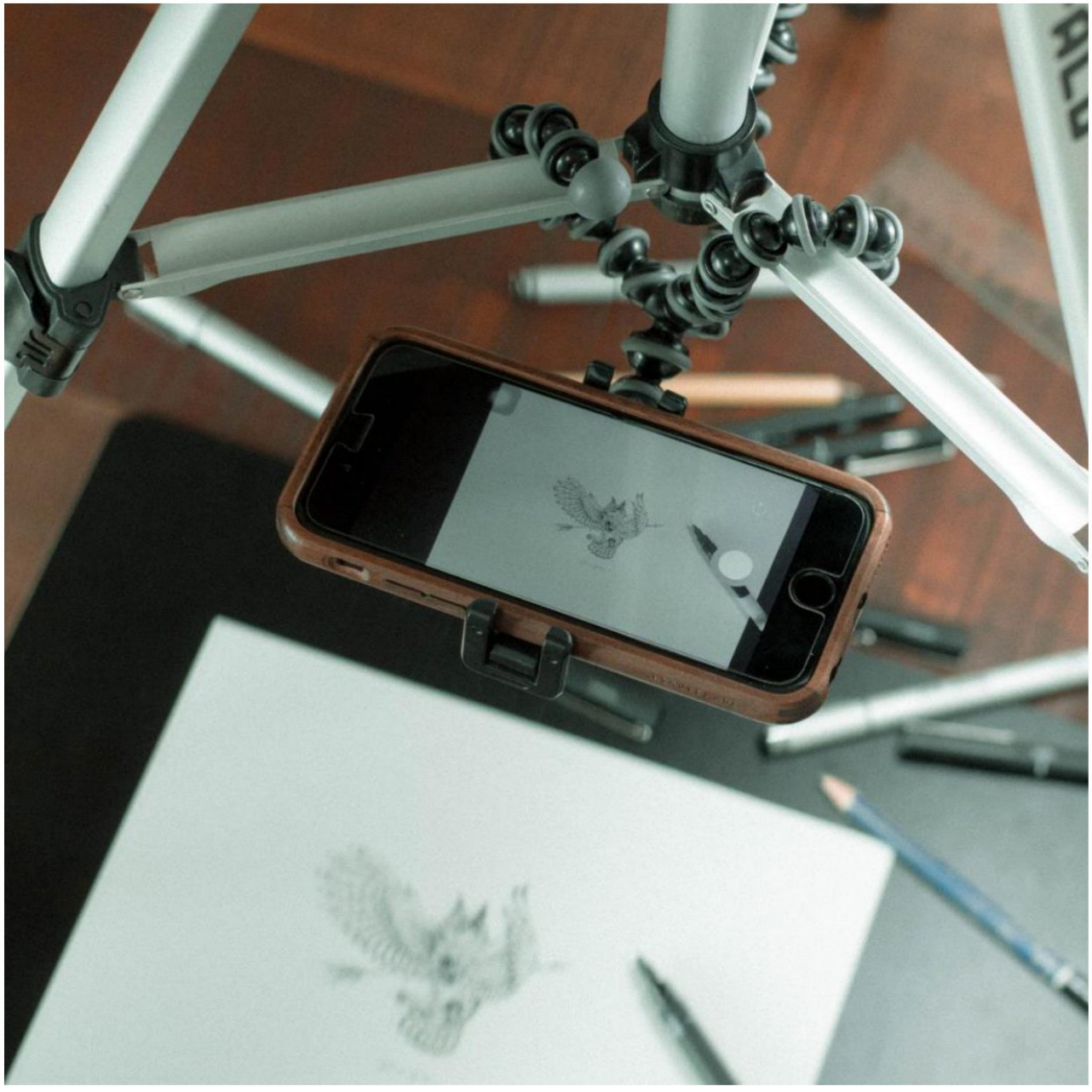


Fig 30 . Artists

3.11.7 Conspiracy Videos

Makes videos regarding mysterious things by studying interesting and attention grabbing facts which and keeps the viewers engaged and makes him think and draw conclusions on his own.

Recording space – Indoor

Camera angles – 1

Requirements

- **Video Recording Device –** Camera / Mobile
- **Audio Recording Device –** Mobile / Microphone / Headset
- **Device holder -** Tripod
- **Lighting** – Natural or Ring light

Fig 31 . Conspiracy vloggers

3.11.8 Gaming Videos

YouTube has become a popular gathering place for video game enthusiasts, leading to the rise of the gaming YouTuber type. As their title suggests, gaming YouTubers are those that create content focused on video games. They help viewers improve their skills and provide entertainment to a gaming-focused audience.

Recording space – Indoor

Camera angles – 1 or 2

Requirements

- **Video Recording Device –** Camera / Mobile + Laptop screen recording
- **Audio Recording Device –** Microphone / Headset
- **Device holder -** Tripod or none
- **Lighting** – Natural or Mood light

Fig 32 . Gaming vloggers

3.11.9 DIY Videos

Known for their creativity and frugality, DIY YouTubers teach viewers how to make customized items instead of buying them ready-made. A DIY video might teach audiences how to embellish their jeans, decorate their phone case, or revamp their bedroom.

Recording space – Indoor and Outdoor

Camera angles – 2

Requirements

- **Video Recording Device –** Camera / Mobile
- **Audio Recording Device –** Mobile / Microphone / Headset
- **Device holder -** Tripod
- **Lighting** – Natural or Studio light

Fig 33 . DIY vloggers

3.11.10 Family Vloggers

Family YouTubers are best known for sharing the joys and challenges associated with raising a family. Parents typically run family channels and post videos in the form of vlogs, which depict daily moments from a first-person perspective.

Recording space – Indoor and Outdoor

Camera angles – Multiple

Requirements

- **Video Recording Device –** Mobile
- **Audio Recording Device –** Mobile
- **Device holder -** Handheld / Tripod
- **Lighting** – Natural

Fig 34 . Family vloggers

3.11.11 Product Review Videos

Technology may be the niche that comes to mind when you're thinking about reviews & unboxing channels. The interest in review & unboxing channels for viewers is to gauge whether a specific product will be worthwhile purchasing.

These are most popular with tech channels, smartphones, computers & cameras being some of the most popular products reviewed.

Recording space – Indoor

Camera angles – 3

Requirements

- **Video Recording Device –** Camera / Mobile
- **Audio Recording Device –** Mobile / Microphone / Headset
- **Device holder** - Tripod/ Selfie stick / handheld / Gimbal
- **Lighting** – Natural light , Studio light , Ring lighting

Fig 35 . Product vloggers

3.11.12 Health and Fitness Videos

Health and fitness YouTubers detail their workout routines and diets for audiences in an effort to inspire others to lead a healthier lifestyle. Some post full-length workout videos that viewers can take with them to the gym or complete in the comfort in their own home. Others post short clips that guide viewers through quick workouts or new exercises.

Recording space – Indoor (House or Gym)

Camera angles – 1 or 2

Requirements

- **Video Recording Device –** Camera / Mobile
- **Audio Recording Device –** Mobile / Collar mics / Headset
- **Device holder -** Tripod
- **Lighting** – Natural lighting , Ambient lighting

Fig 36 . Fitness vloggers

3.11.13 Educational Videos

Learning YouTubers epitomize the democratization of knowledge made possible by the internet. Creators of this type educate viewers of all ages on a wide range of topics, including science, reading, foreign languages, and more.

Recording space – Indoor

Camera angles – 1 or 2

Requirements

- **Video Recording Device –** Camera / Mobile
- **Audio Recording Device –** Mobile / Collar mics / Headset
- **Device holder -** Tripod
- **Lighting** – Natural , Ring light. Studio light

Fig 37 . Educational vloggers

3.11.14 Travel and Lifestylle Videos

As YouTube has grown the platform has become a hub for first-hand travel and adventure knowledge. Previously, individuals relied primarily on websites and books to plan vacations. Today, travel YouTubers bring viewers on their adventures and lend helpful travel recommendations along the way.

Recording space – Outdoor

Camera angles – 1

Requirements

- **Video Recording Device –** Camera / Mobile / Gopro
- **Audio Recording Device –** Mobile / Microphone / Headset
- **Device holder -** Mini Tripod / Gimbal / Selfie stick / Drones
- **Lighting** – Natural lighting

Fig 38 . Travel vloggers

3.11.15 Music and Dance Videos

Music channels can take many forms on YouTube. Singers, songwriters, choreographers & dancers are all apart of this category. Singers and songwriters produce their own original compositions or cover popular pieces.

Recording space – Indoor

Camera angles – 1 or 2

Requirements

- **Video Recording Device –** Camera / Mobile
- **Audio Recording Device –** Mobile , Microphone
- **Device holder -** Tripod
- **Lighting** – Natural / Studio light / Ambient light

Fig 39 . Music and dance vloggers

3.11.16 Reaction Videos

Makes videos by giving real time reactions on the videos suggested by the viewers and expresses their opinions about the videos while watching it.

Recording space – Indoor

Camera angles – 1

Requirements

- **Video Recording Device –** Camera / Mobile
- **Video seeing device –** Laptop
- **Audio Recording Device –** Headset / Mobile
- **Device holder -** Mini Tripod
- **Lighting** – Natural / Studio light / Ambient light

Fig 40. Reaction vidoes

3.11.17 Sports Videos

Sports channels generally require one thing, a sporting talent. People showcase their sporting talents and records the videos to entertain the viewers. It can be funny or skillful as far as the viewer finds it interesting.

Recording space – Outdoor

Camera angles – Multiple

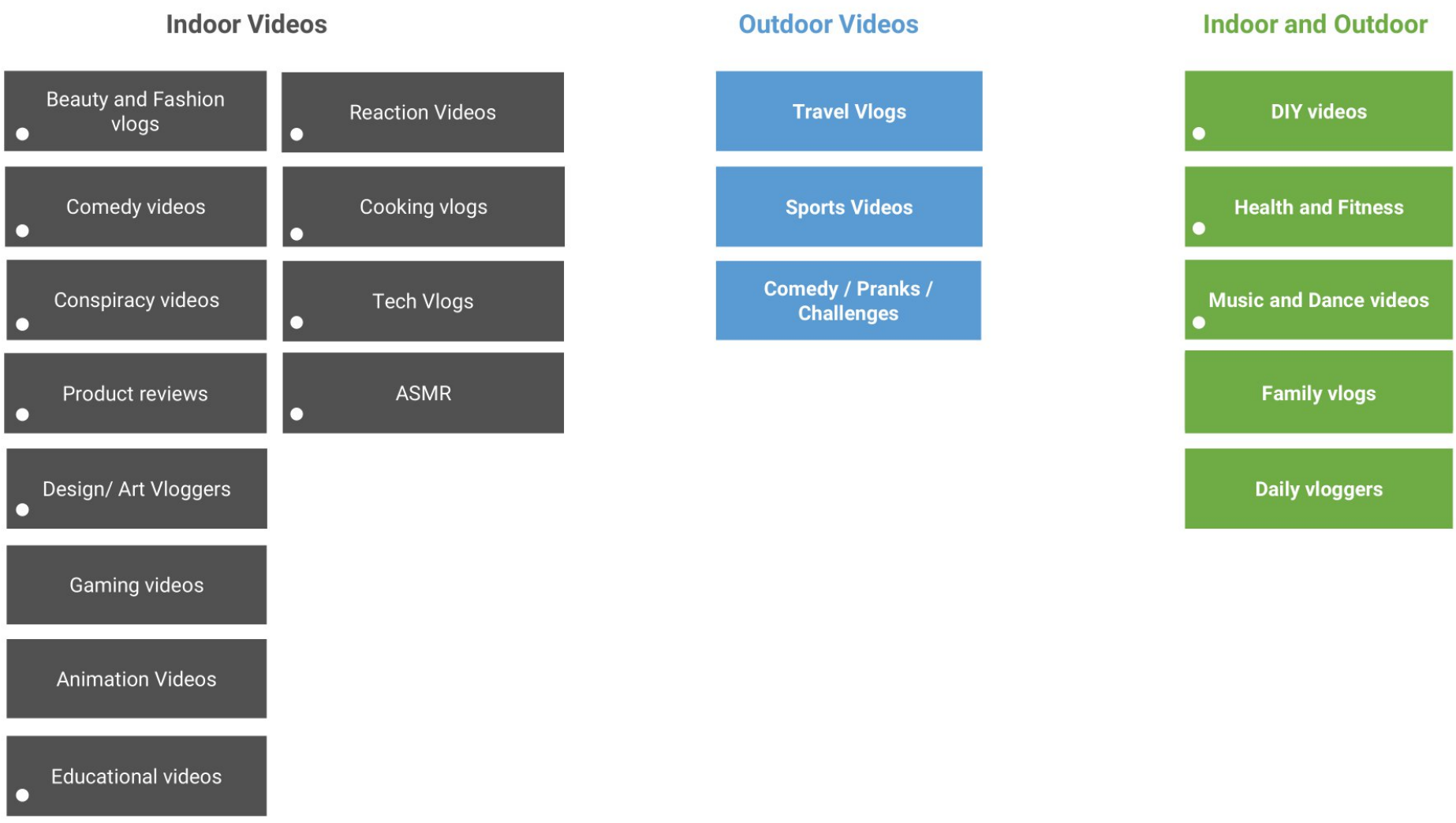
Requirements

- **Video Recording Device –** Camera / Mobile
- **Audio Recording Device –** Headset / Mobile / Microphone
- **Device holder -** Tripod / Gimbal
- **Lighting** – Natural lighting

Fig 41 . Sports vloggers

3.12 Classification of Videos

The types of Content creators were classified according to their recording environment and the lighting conditions required. The white dot represents cases where external lighting is required



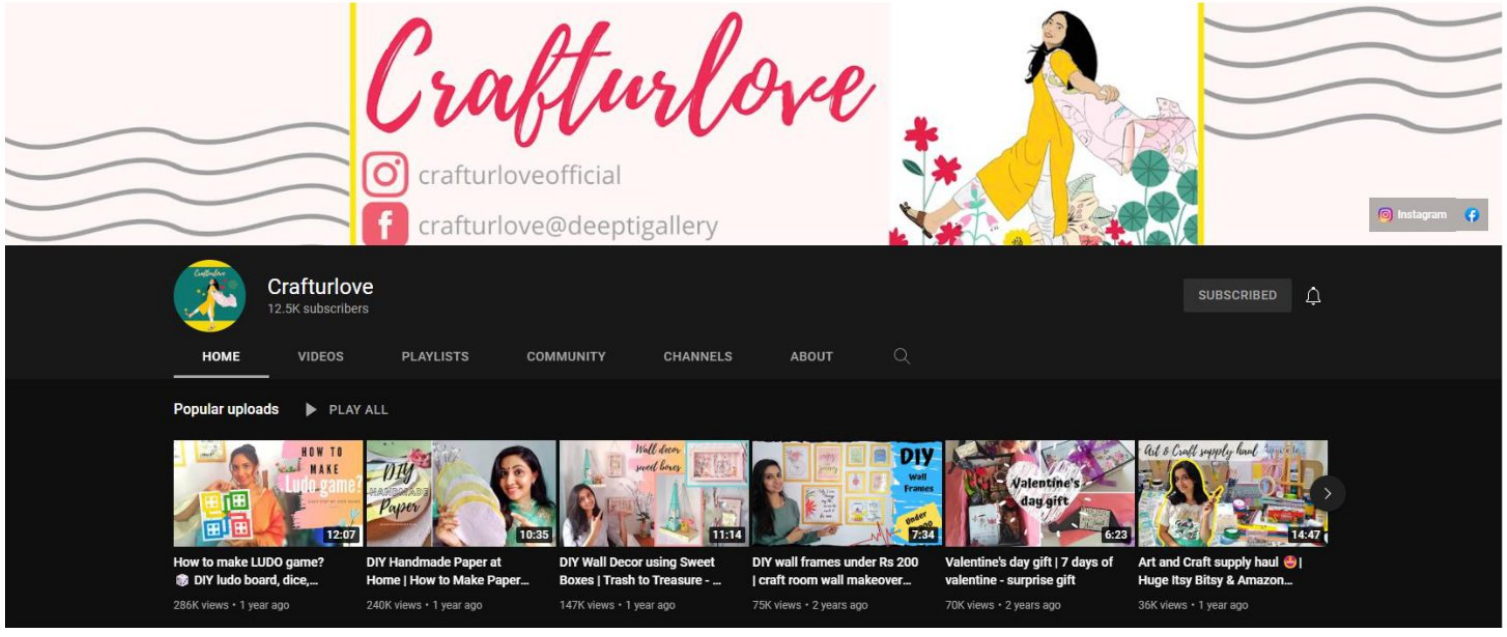
04. User Interviews

Different content creators from various different categories were interviewed and the difficulties they faced were carefully recorded and analysed.

Fig 41. User interviews

4.1 User 1

Art and Craft Vlogger



Name : Deepti Verma

Channel name : Crafturlove

Location : Rajasthan

Fig 42 . User 1 profile

Recording Space
Indoor

Camera Angles
2

Lighting
Natural light

Recording Device
Mobile - Samsung F62

Equipment used

Tripod

Gorilla tripod

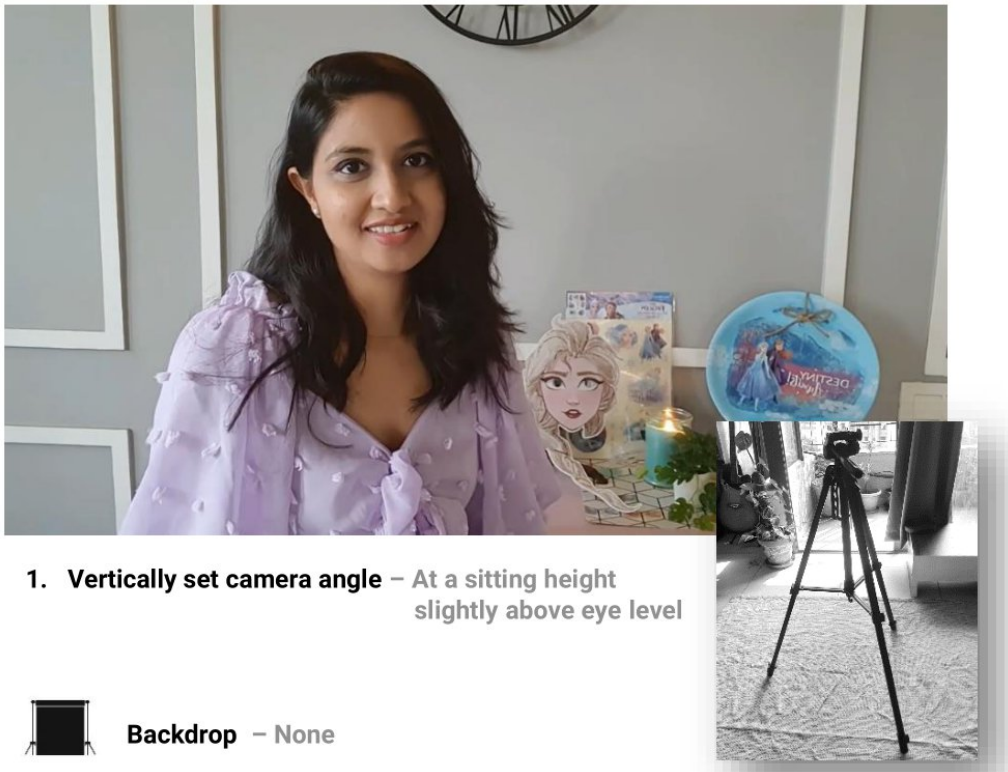
Bluetooth controller

Storage
In the shelf

Different content creators from various different categories were interviewed and the difficulties they faced were carefully recorded and analysed.

Fig 43 . User 1 Equipments

Camera angles used



1. **Vertically set camera angle** – At a sitting height slightly above eye level

2. View form top (Works sitting on the floor) – Using Tripod

Backdrop – None

Time taken for whole Setup – 15 mins

Mobile camera used – Front cam for introduction , Back cam for shooting craftworks

Additional helpers – No one

Fig 43 . User 1 camera views

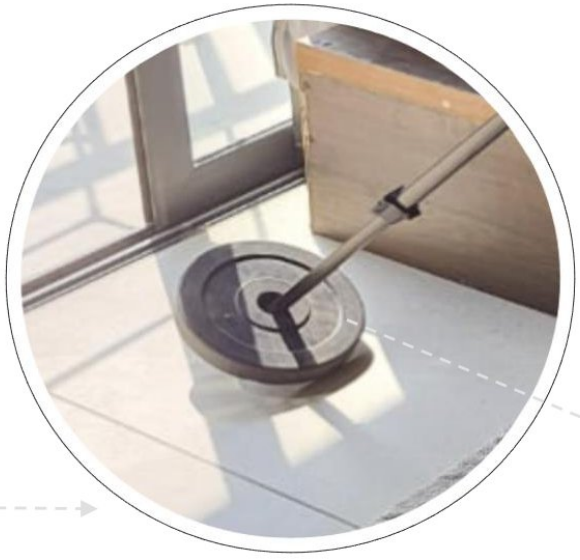
Working Environment

Natural Lighting

Tripod – Leaning forward position.

Floor –
Used as the working platform

Problems Encountered



Dumbbell plate used on one of the legs for stability

Balancing the tripod in Top view recording

Dependability on Natural lighting – Records in daylight only

Storage – No dedicated space for storage and protection

Portability – Shifting the equipment for scene change and carrying it around

Misplacing the Bluetooth controller

Fig 44 . User 1 problems

4.2 User 2

Craft Vlogger

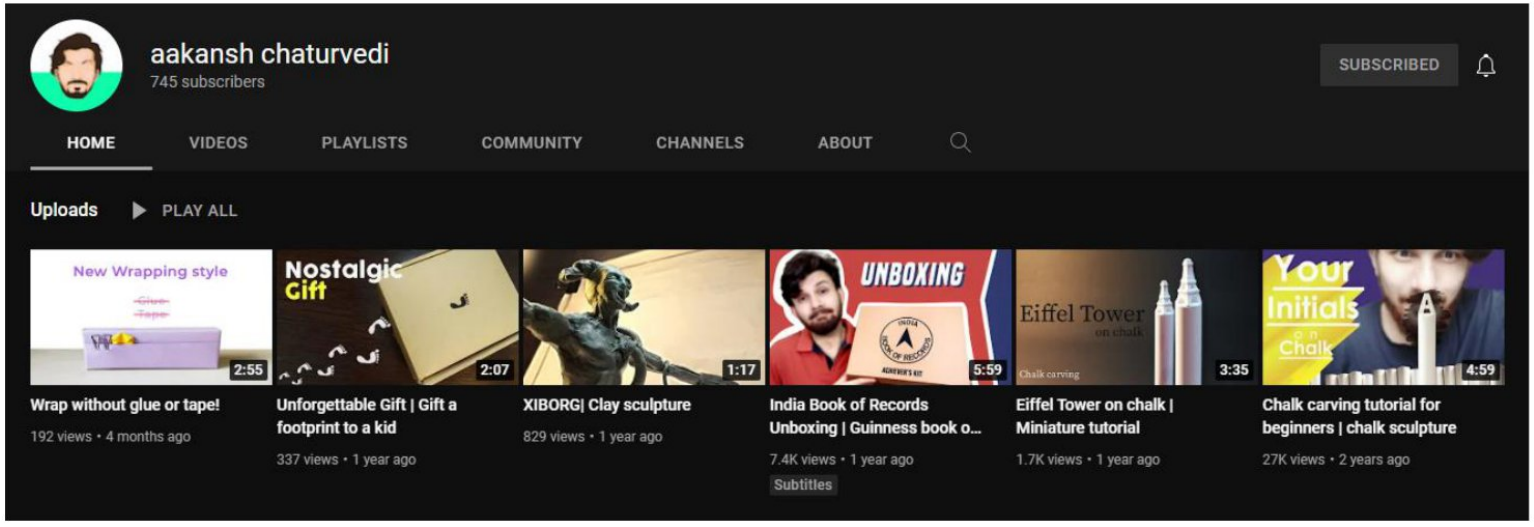


Fig 45 . User 2 profile

Name : Aakansh Chaturvedi

Channel name : aakansh chaturvedi

Location : Khandwa , MP

Recording Space
Indoor

Camera Angles
2

Lighting
Natural + External

Recording Device
Mobile - Samsung M51

Equipment used

Microphone

Phone holder with gooseneck

Tripod

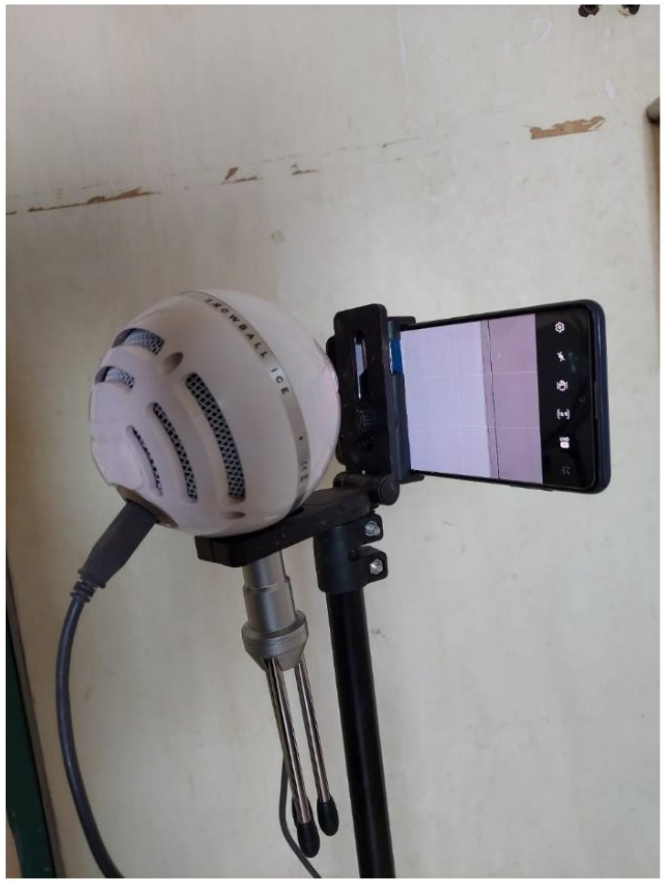
Fig 46 . User 2 equipment

Equipment used

Tripod Top Attachment portion

Tripod bottom Mechanism

Phone holder

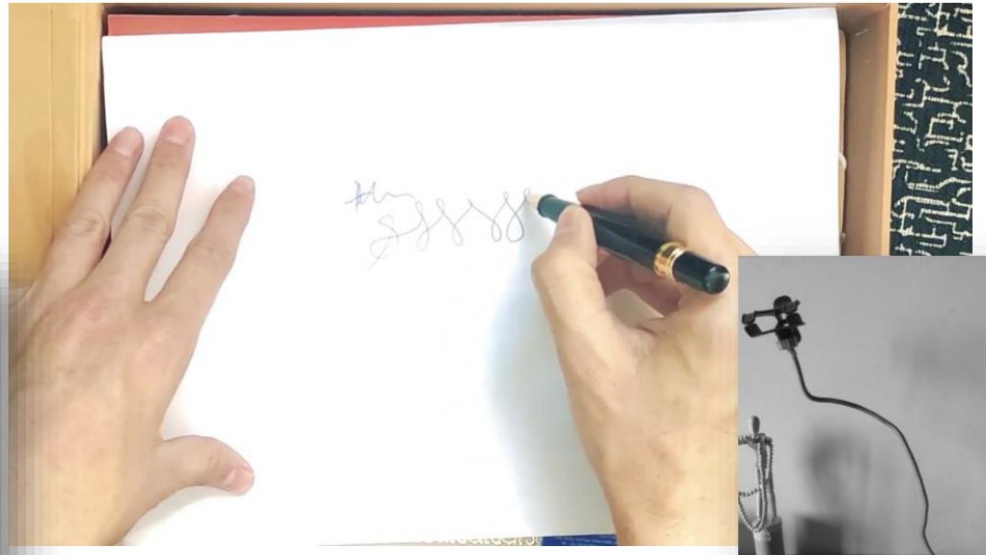


Mic kept onto the holder

Fig 47 . User 2 equipment 2

Camera angles used

1. **Vertically set camera angle** – At a sitting height at eye level



2. View form top (Works on the table)
Using Gooseneck Mobile holder

Fig 48 . User 2 camera angles

Backdrop – Plain Wall

Time taken for whole Setup – 10 mins

Mobile camera used – Back cam Only

Additional helpers – No one

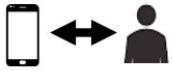
Working
Environment

Fig 49 . User 2 Recording environment

Problems Encountered

Remembering the dialogues while recording

Face not visible while talking since using back camera of the phone



Not able to control the phone from a distance

Storage – No dedicated space for storage and protection

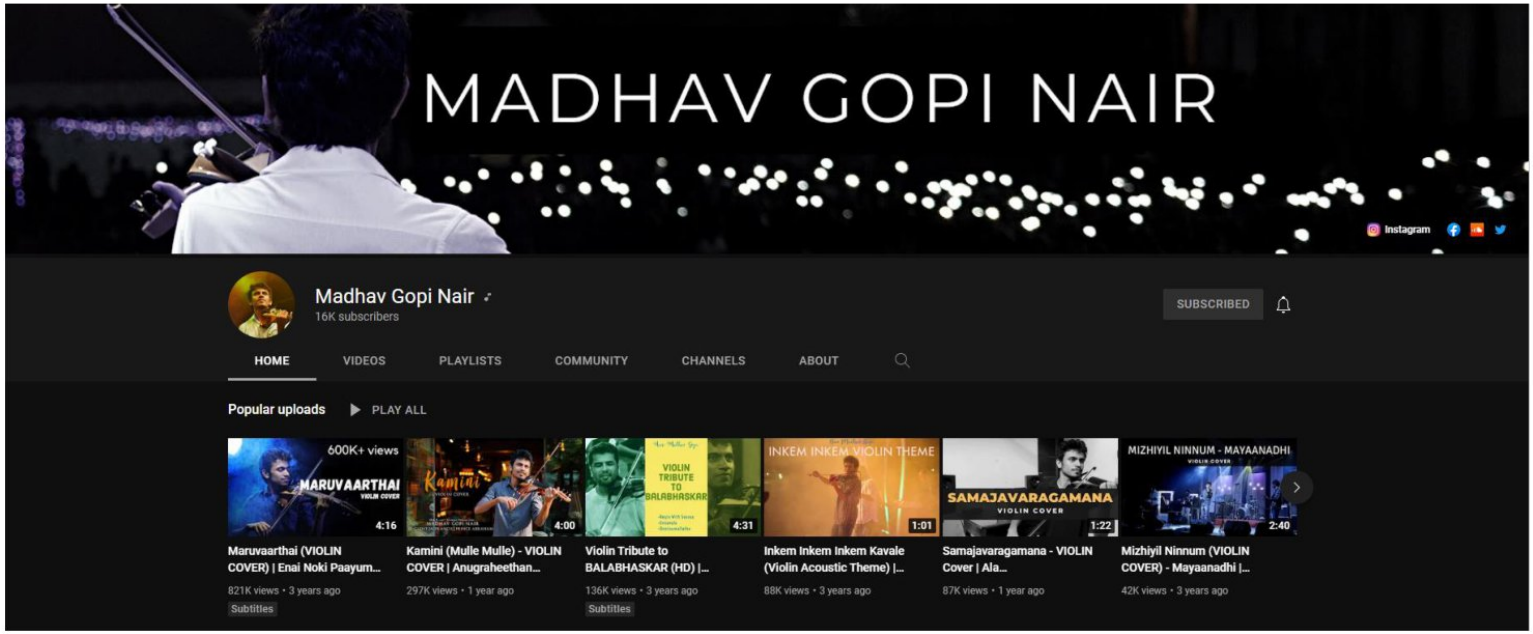
Portability – Shifting the equipment for scene change

Gooseneck Holder – Shakes just after pressing the
record button results in a blurry video

Fig 50 . User 2 problems

4.3 User 3

Music Vlogger



Name : Madhav Gopi Nair

Channel name : Madhav Gopi Nair

Location : Aluva , Kerala

Fig 51 . User 3 profile

Recording Space
Indoor + Outdoor

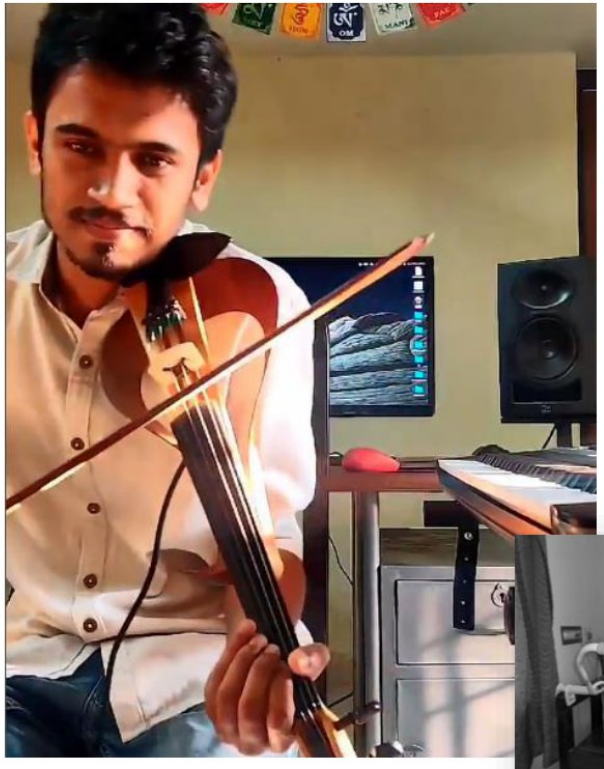
Camera Angles
Outdoor – Multiple
Indoor – 1

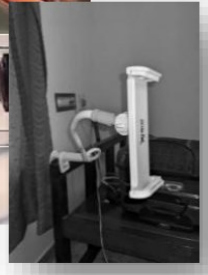
Lighting
Natural + External

Recording Device
Mobile – Iphone 7s
Camera – Canon 1500D

Camera angles used

Indoor





Gooseneck holder attached to tabletop to record

Backdrop – None

Time taken for whole Setup – 10 mins

Mobile camera used – Front cam Only

Additional helpers – No one

Outdoor

Shot with professional videographers – Multiple angles

Outdoor videos are shot professionally from multiple camera angles along with a small crew and are also edited by professionals

Fig 52 . User 3 camera angles

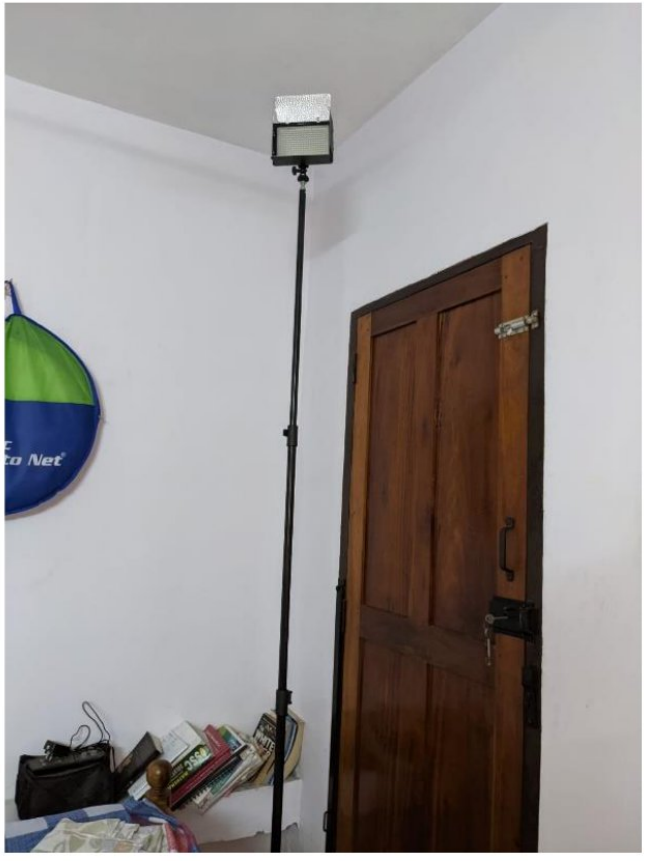
Equipment used

Tripod

Phone holder

Attaching Mechanism

Fig 54 . User3 equipment



External Lighting

Holding Stand

Tripod

Fig 55 .User 3 equipment 2

Problems Encountered

Storage issues –

- Big tripods takes up a lot of space
- Shifting it every time to open the door
- Balancing it when fully extended

Setting camera angles –

- Difficulty in finding an attachable surface every time
- Getting correct angles
- Cross verifying the area covered in video , since using back camera for recording.

Fig 56 .User 3 problems

4.4 User 4

Fashion Vlogger

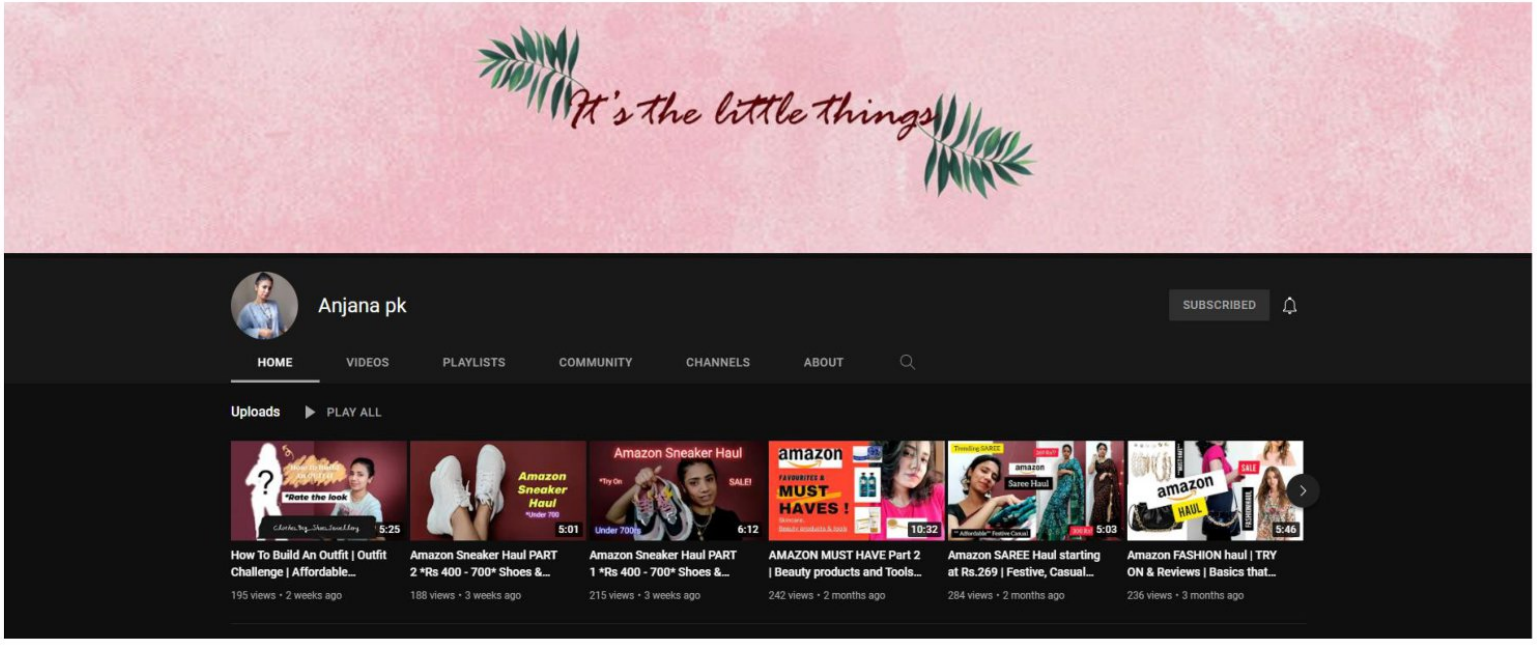


Fig 57 . Use 4 profile

Name : Anjana P K

Channel name : Anjana pk

Location : Calicut , Kerala

Recording Space
Indoor

Camera Angles
1

Lighting
Natural + External

Recording Device
Mobile – One plus Nord

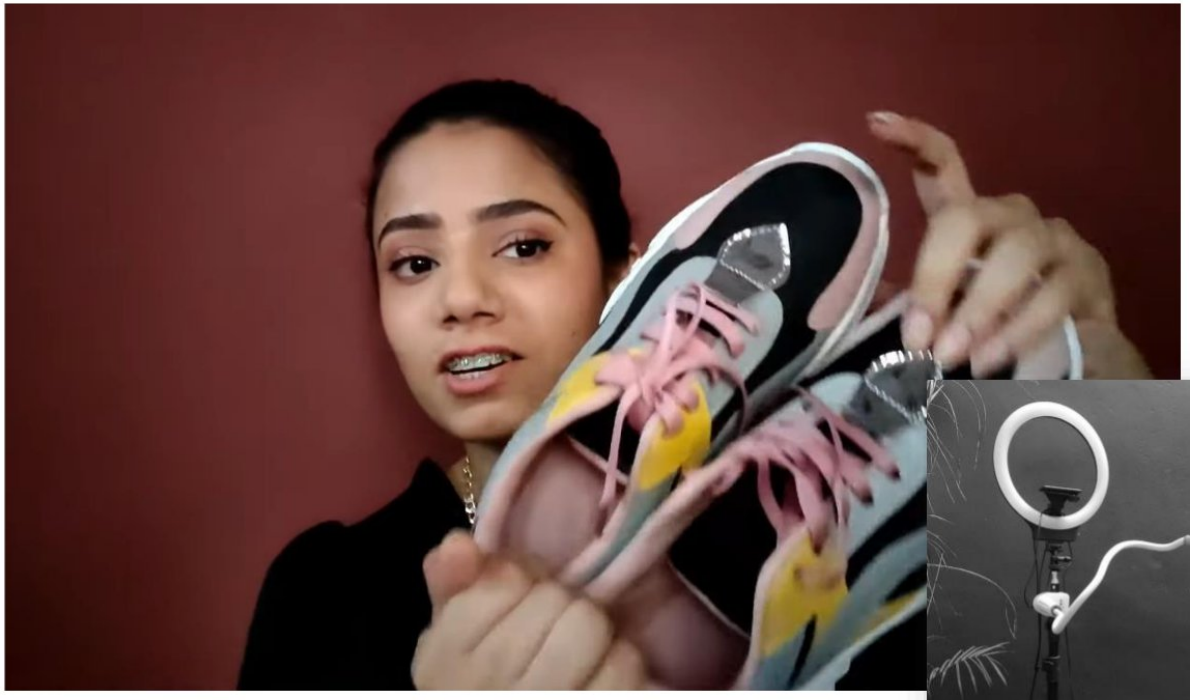
Equipment used

ɔd with Ring light + External phone holder

Tripod

Tripod + Gorilla tripod

Camera angle used –



Vertically set at a height of 150 - 155 cm (Standing and Recording)

Fig 59 . User 4 camera angles

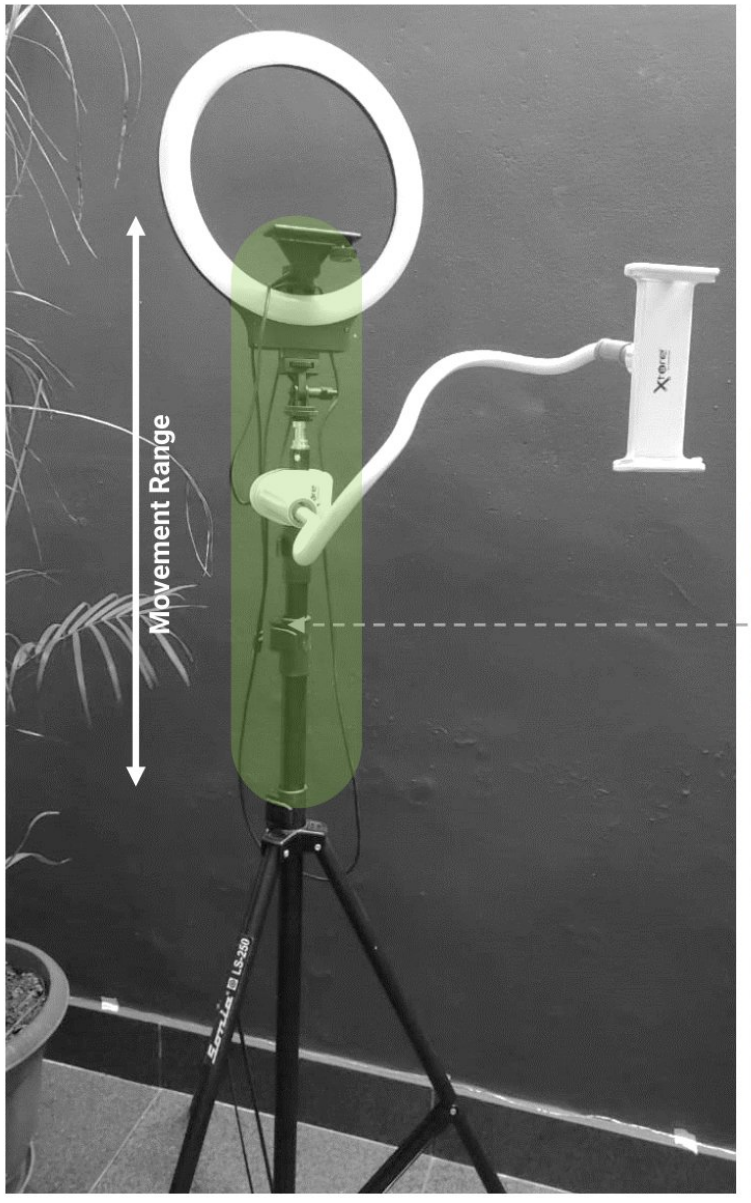
Backdrop – Plain wall

Time taken for whole Setup – 10 to 20 minu

Mobile camera used – Front cam only

Additional helpers – No one

Problems Encountered



Wishes to take videos while sitting on the floor but light doesn't down go beyond a certain height

External phone holder attachment

USB pin should be present in the vicinity

Mic – Stored in a separate Polythene bag
Often misplaced

Takes up a lot of space
(Horizontal and vertical)

Difficult to balance and shift it often to clean the room

Dust accumulation

Fig 60 . User 4 problems

4.5 User 5

Fashion Vlogger

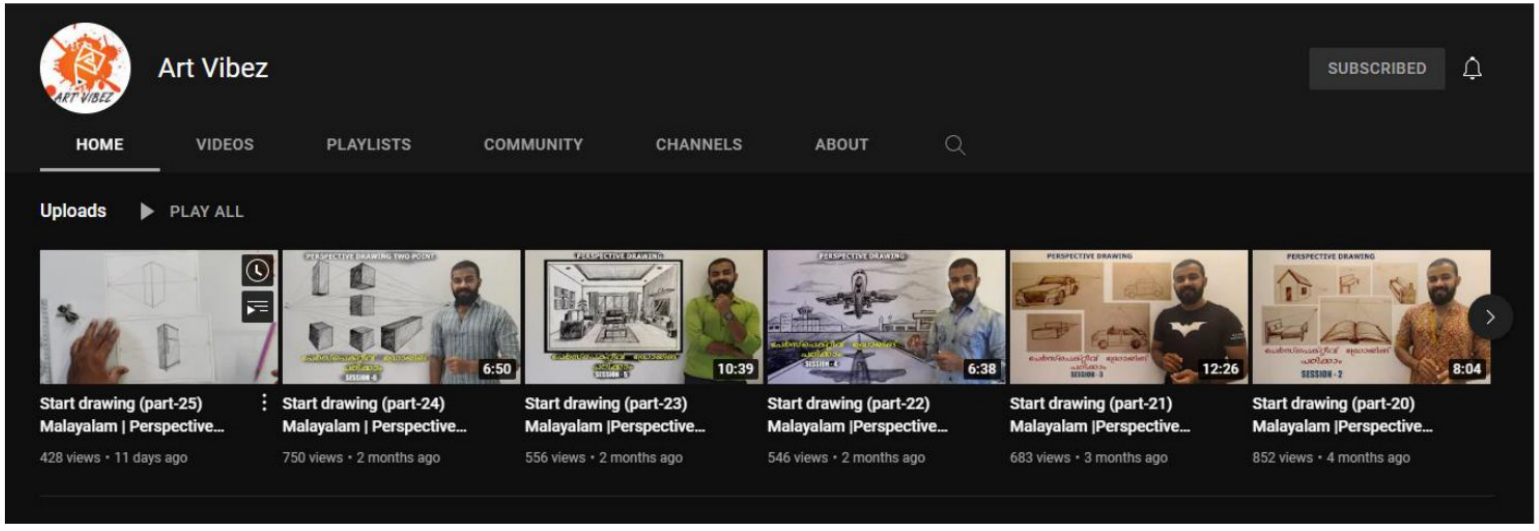


Fig 61 . User 5 pofile

Name : Vikas Bhadra

Channel name : Art Vibez

Location : Kochi , Kerala

Recording Space
Indoor

Camera Angles
2

Lighting
Natural + External

Recording Device
Mobile – Redme Note 9 Pro

Equipment used

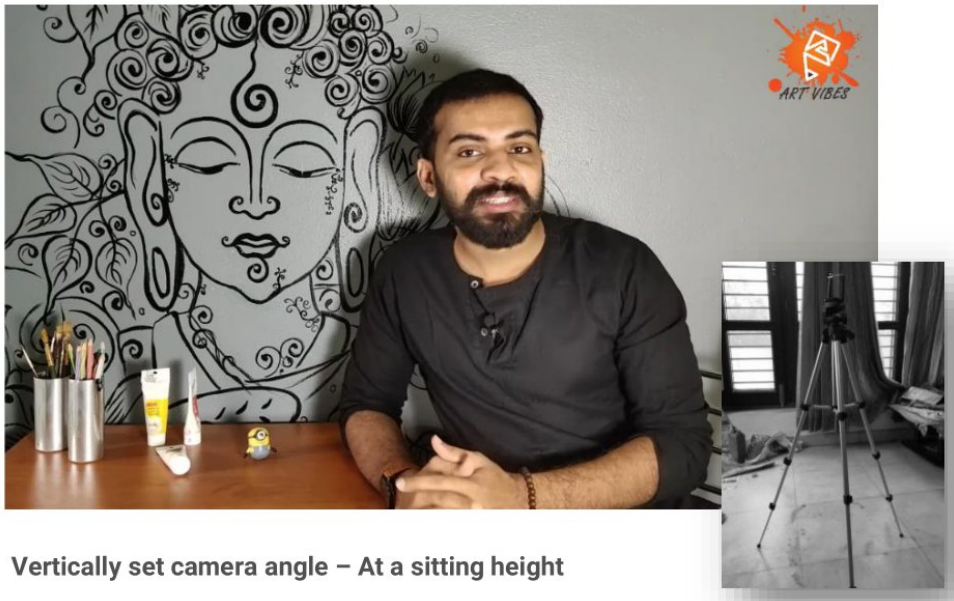
Tripod

Self made adjustment

Fig 62 . User 5 equipment

Mobile Holder

Camera angles used



Vertically set camera angle – At a sitting height

2. View form top – Using a self made adjustment

Fig 63 . User 5 camera angles

Backdrop – Painted Wall

Time taken for whole Setup – 15 mins

Mobile camera used – Front cam for introduction , Back cam for drawing tutorials

Additional helpers – No one

Problems Encountered

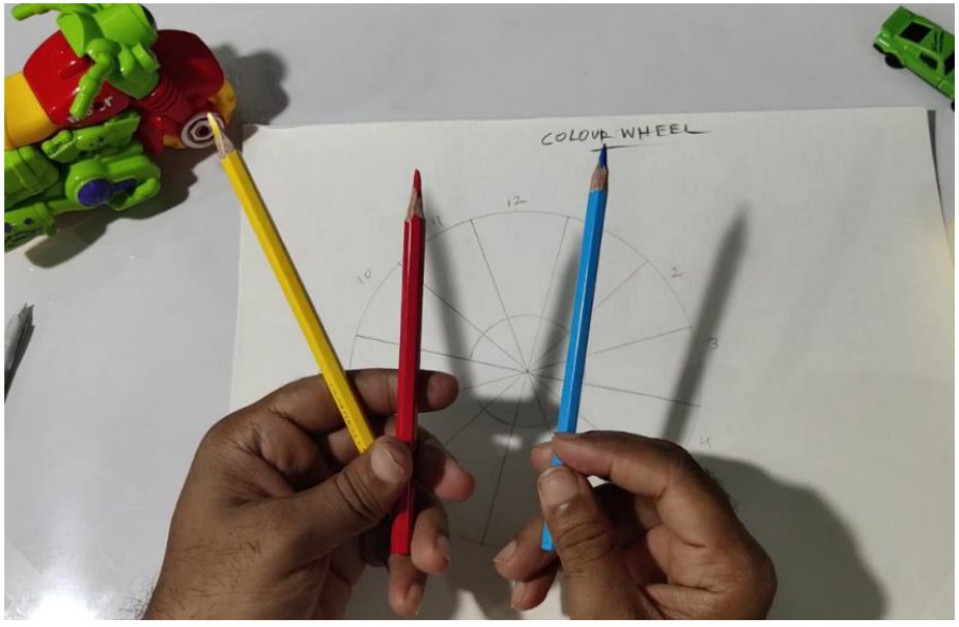
Top view Recording – Made own arrangement

Heavy

No height adjustability options

Not suitable for a longer table

Darker shadows due to improper lighting



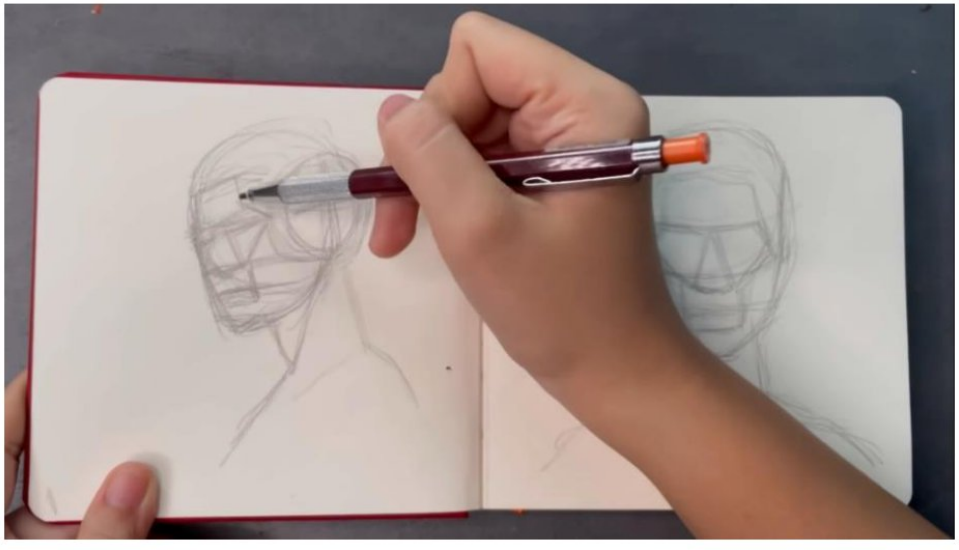


Fig 64 . User 5 problems

4.6 User 6

Travel Vlogger

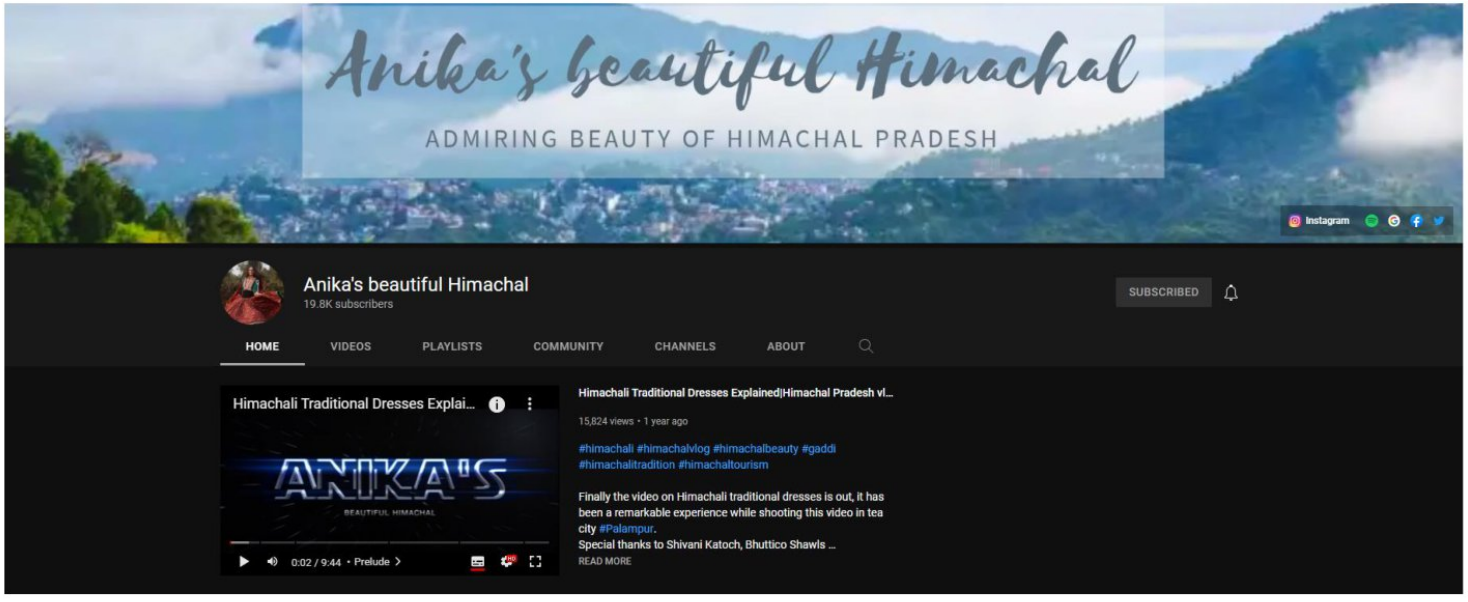


Fig 65 . User 6 profile

Name : Anika Sharma

Channel name : Anika's beautiful Himachal

Location : Himachal Pradesh

Recording Space
Indoor + Outdoor

Camera Angles
2

Lighting
Natural + External

Recording Device
Mobile – Samsung F41

Equipment used

Tripod

Tripod cum Selfie stick

Fig 66 .User 6 equipment

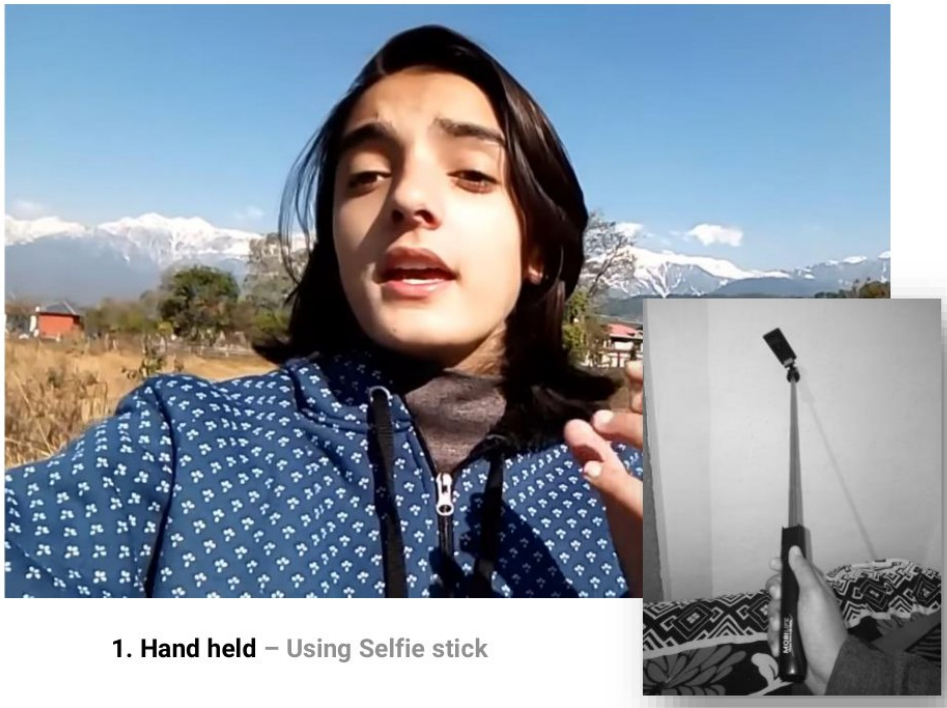
Equipment used

LED Panel Lighting

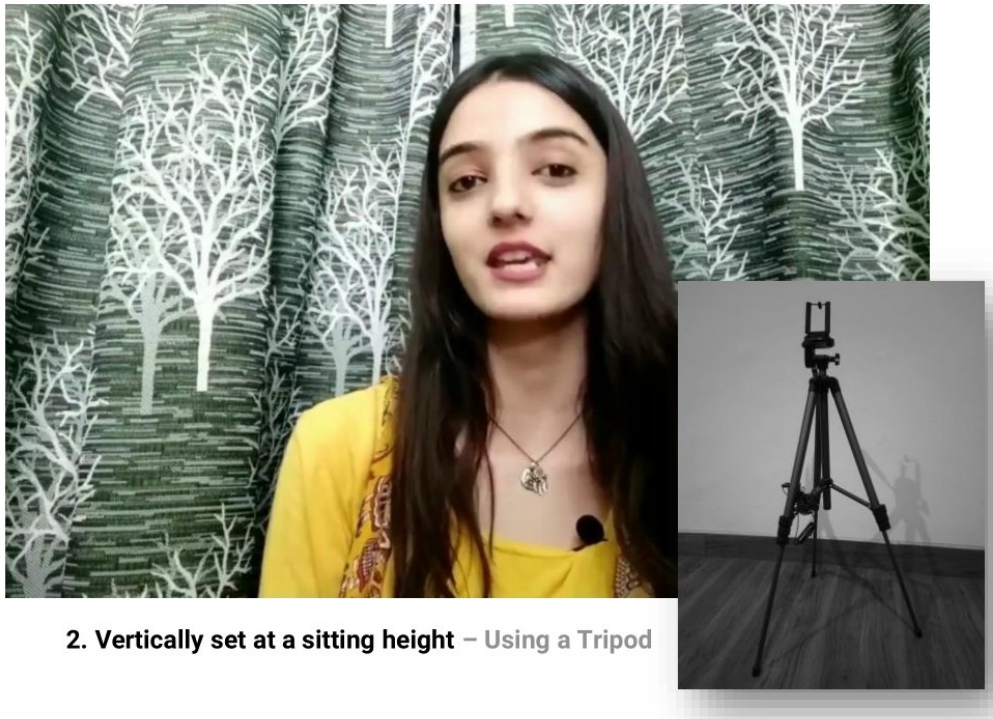
Self made reflectors

Fig 67 .User 6 equipment 2

Camera angles used



1. Hand held – Using Selfie stick



2. Vertically set at a sitting height – Using a Tripod

Fig 68 . User 6 camera angles

Backdrop – None (Outdoor) , A printed Curtain (Indoor)

Time taken for whole Setup – 5 Mins

Mobile camera used – Front cam when using Selfie stick , Back cam while using tripod

Additional helper - None

Problems Encountered

The tripod cum selfie stick was not very stable when the surface was uneven

It would fall down easily as its centre of gravity gets easily shifted

The user had to use additional self made reflectors as she found that the light from the LED was not enough

Fig 69 . User 6 problems

4.7 User 7

Food and Recipe
Vlogger

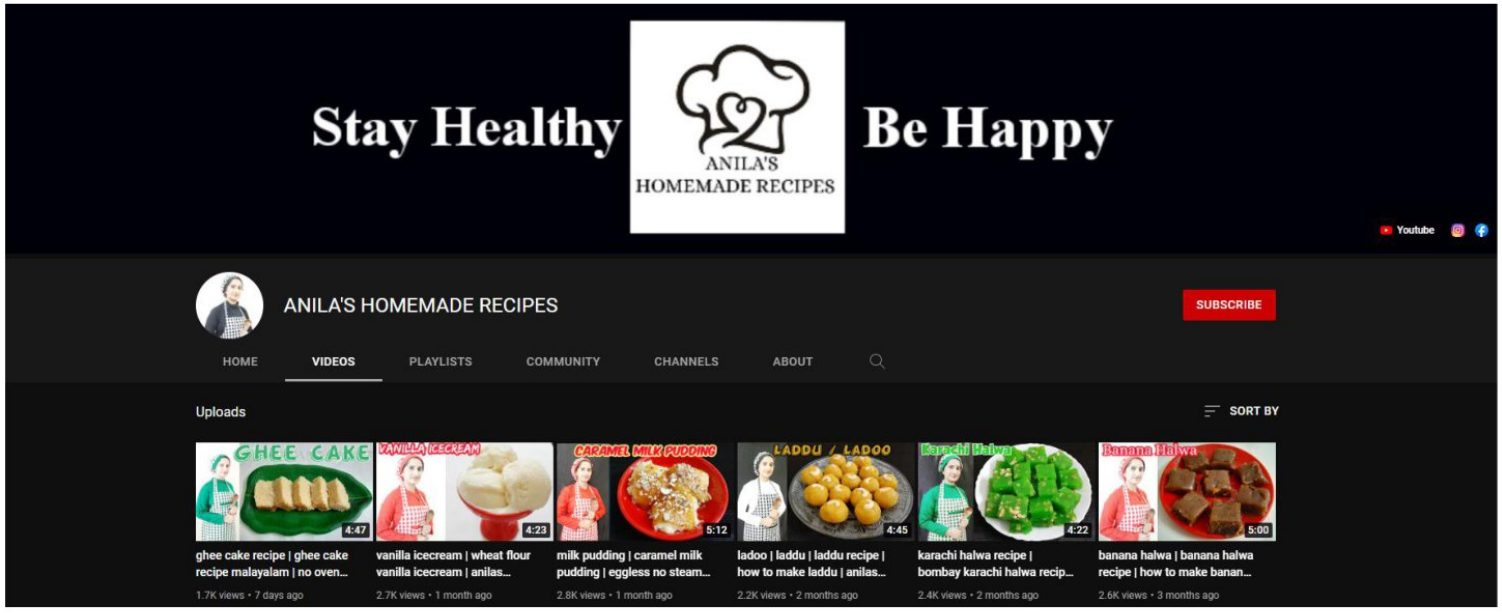


Fig 70 .User 7 profile

Name : Anila Justin

Channel name : ANILA'S HOMEMADE RECIPES

Location : Kerala

Recording Space
Indoor

Camera Angles
2

Lighting
External

Recording Device
Mobile – Redme Note 11 pro

Major Camera angles used

Vertically set camera angle – At Eye Level

Panning the cam using hand

Washing scenes from an inclined angle

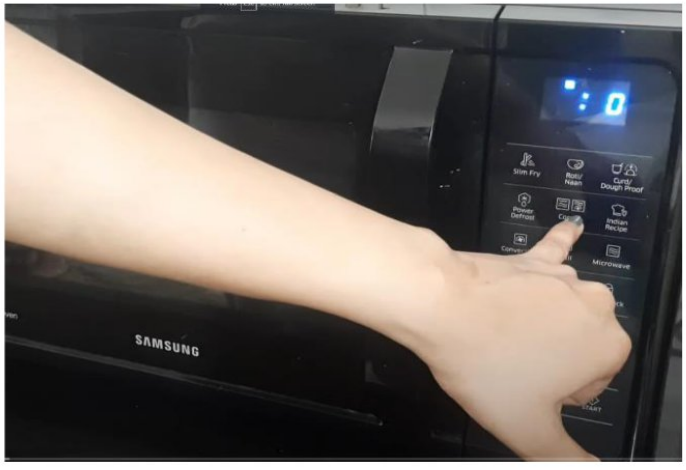
Cutting / Chopping or preparation scenes

Shooting stove from top

Grinder scenes

Fig 71 . User 7 camera angles

Major Camera angles used



Baking scenes

Freezer scenes

Serving

Fig 72 . User 7 camera angles 2

It was observe that in cooking videos a lot of camera angles were required and the user frequently needed to shift the camera from place to place after shooting each scene. Sometimes even camera panning was required while introducing the ingredients or finally serving the dishes. In the starting, user takes an introduction scene where the camera is steady and facing the user. After that the process starts and the camera angles shift constantly. a

Problems Encountered

Had to make a self made adjustment for holding the phone in Arial view

Top view – Fumes interferes with the camera lens

Requires constant shifting of the camera –
At least 4 different positions during a recipe on the kitchen Top itself

- Channel Introduction scene
- Introducing the ingredients
- Washing the ingredients
- Preparation (Cutting , Chopping etc)
- Cooking (recording the stove from top)
- Baking / Freezing ? Grinding scenes
- Serving in dishes

Difficulty in operating the phone – Since hands get wet and dirty

Additional person required for operating the mobile

Risk of toppling the set up over the dish or stove

Fig 73 . User 7 problems

P3

4.8 Problem Analysis

The various problems of each categories were carefully analyzed and grouped on table in order to identify the categories which faced the most number of problems

Arial View Shooting	Art and Craft	Food and Recipe	Music		
Lighting and Shadow issues	Art and Craft		Music	Fashion	Travel and Lifestyle
Height adjustability of Tripod/ Ring Light	Art and Craft	Food and Recipe			Travel and Lifestyle
Frequent shifting and Camera angle Requirements		Food and Recipe			Travel and Lifestyle
Storage issues	Art and Craft	Food and Recipe	Music	Fashion	
Portability	Art and Craft	Food and Recipe		Fashion	
Additional person required		Food and Recipe			

Upon analysing the data it was found at the most number of problems were faced by cooking video makers and followed by arts and craft video makers. So it was decided to focus more on these type of content creators.

05. Market Study

The type of gadgets and devices available for mobile videography in the market were carefully studied

Fig 74 . Market study

Basic Equipment
used by YouTube Content Creators

Fig 75 . Camera and mobile

Camera / Mobile

Fig 76 . Tripod and gimbal

Tripods / Gimbals

Fig 77 . Tripod with lighting

LED or Ring Lighting Mechanisms

Fig 78 . Microphone

External Microphones

Fig 79 . Diffuser light

Soft boxes

Fig 80 . Bluetooth comptroller

Camera remote

Types of Tripods

Aluminium Tripod

These are portable tripods that may be used with cellphones, digital cameras, and pocket cameras. It has a three-way rotating head that can be rotated 360 degrees. It's composed of high-quality aluminum alloy, so it'll last a long time, and it has a non-slip rubber foot pad. It has three extendable pieces that may be raised to a height of 50 inches.

Fig 81 . Al tripod

Gorilla Tripod

This tripod is composed of high-quality ABS, which means it will outlast other plastic tripods. It can be used with a smartphone, GoPro, or DSLR camera. It includes an anodized revolving sphere as well as a precise angle lock. It has a maximum load capacity of 1kg and a maximum height of 240mm. It is very flexible due to the anti-slip elastic material. It comes with a Bluetooth remote that makes taking images a breeze..

Fig 82 . Gorilla tripod

Camera / Mobile

Fig 2 . YouTube logo

Mini tripod

It works with smartphones, GoPro cameras, and most DSLR cameras. It has a screw connector on the ball head and a maximum operating height of 7.87 inches. It has anti-skid rubber feet that keep it steady and can support up to 1 kg of weight. If you want a tripod that you can simply pack in your suitcase, this is a fantastic choice.

Fig 83 . Mini tripod

Long legged tripods

These tripods have 4-tube section aluminium legs that extend to a maximum height of 136cm. This little tripod is ideal for use with smartphones, compact cameras, and most DSLRs. It has a 3-way pan head and a quick release plate, so it's suitable for a wide range of photographers. A level tester is also included with this tripod, which might be beneficial when the ground is not level.

Fig 84 . Long legged tripod

Flexible tripods

These tripods are is comprised of ABS, which makes it sturdy and long-lasting. It includes a revolving sphere with anodized finish to ensure it can withstand weight. It may be used with smartphones, pocket cameras, GoPro cameras, and DSLR cameras. It comes with a sturdy smartphone holder that allows you to mount your phone.

Fig 85 . Flexible tripod

Types of Tripod heads

Ball head

Fig 86 . Ball head

It moves around using a ball structure, as the name suggests. You may see a spherical ball resting in a groove on any ball head, and the ball will have a piston at one end that connects to the mounting setup. Manufacturers use different mounting methods. It's one of the most popular tripod heads on the market. You may put your camera in practically any angle thanks to the ball structure.

Pan and tilt tripod head

Fig 87 . Pan and tilt

Pan and Tilt heads are a fantastic alternative if you don't want to use various angles and want to limit your camera movement to two axes. There will be two handles, one for horizontal movement and the other for vertical movement. If you wish to move the camera horizontally, lock the tilt head and loosen the pan head, then move the camera around. Lock the pan head, loosen the tilt head, and adjust the tilt handle for vertical movement.

Gimbal head

Fig 88 . Gimbal head

If you're photographing wildlife or birds, you'll want to use the 500mm and 600mm super telephoto lenses. If you're using a tripod, you'll need to acquire the correct balance and stability with your camera and lens combo to get the photo. As a result, you'll need a Gimbal head for your tripod. Gimbal heads are available in a variety of price points. To get a perfect balance, you need to align the camera and lens combination in the center of

Fluid head

Fig 89 . Fluid head

The fluid head is the appropriate tripod head if you want to capture videos alongside your images or if you are a committed cameraman. Fluid heads are a type of Pan and Tilt head that uses a hydraulic damping mechanism to provide smooth and consistent shots. Fluid heads let you to change the friction, allowing you to achieve the desired pan speed. f the movement isn't smooth, the audience will notice jerks in your video, which might be distracting. When compared to other tripod heads, fluid heads are more expensive.

Motorized tripod head

Fig 90 . Motorized tripod

A motorized tripod head might be a wonderful addition to your camera set if you're shooting panoramic photos or time-lapse recordings. This tripod head uses a battery-powered motor to achieve precise movement, as the name implies. The majority of them are powered by a rechargeable battery, and you can control the speed and precision with inbuilt controls on the head. Some high-end models even include a smartphone application that allows you to change these parameters and control it remotely. The payload capacity of a motorized tripod head is the most important factor to consider when purchasing one. It must be capable of supporting the weight of your camera. Heads with motors are available..

Tilt head

Fig 91 . Tilt head

A tilt head can be a wonderful alternative if you use a monopod for your photography. They're made exclusively for monopods. With a tilt head, you can only move vertically. You must spin the monopod in your hand for horizontal movement. You don’t have to depend on the head for the pan movement. There are mechanisms in place for them.

Pistol grip head

Fig 92 . Pistol grip

A ball head with a pistol grip is known as a pistol grip head. Is it just a matter of changing the handle? No, pulling the trigger button on the handgun allows you to control the ball joint tension.Remove your fingers from the trigger button when you're satisfied with the camera position, and the head will be fixed in that position. There aren't many photographers who use pistol grip heads.

Panoramic tripod head

Fig 93 . Panoramic head

Meant for panoramic photographers who doesn't want to spend the money on motorized heads, regular panoramic heads are the way to go. The tripod head allows you to move the camera horizontally in this case. The camera movement angle will be marked in degrees on the base plate. As a result, you can snap individual photographs and stitch them together afterwards to create a panoramic image.

Three way heads

Fig 94 . Three way

A three-way tripod head is a great choice if you want to move your camera with precision. It works in the same way as a ball head, allowing you to position your camera in all three axes.A three-way tripod head, on the other hand, will assist you in achieving a perfect position. If you want to perform the same thing with a ball head, you'll have to do a lot more experiments.Three lever handles will be used to control the three axes separately. The biggest downside of this sort of tripod head is that it takes a long time to place the camera.

Most commonly used Equipment

Tripods whit light and microphone attachment

Tripods whit ring light

Holder and microphone

Typical tripod

gimbal

Mini tripods

Fig 95 . Commonly used equipmernt

Gorilla Tripod with Bluetooth Controller

Phone Holder

Bluetooth Controller

Flexible and can be easily attached anywhere

Fig 96 . Gorilla tripod

Rotatable Design

Can be set at Different Angles

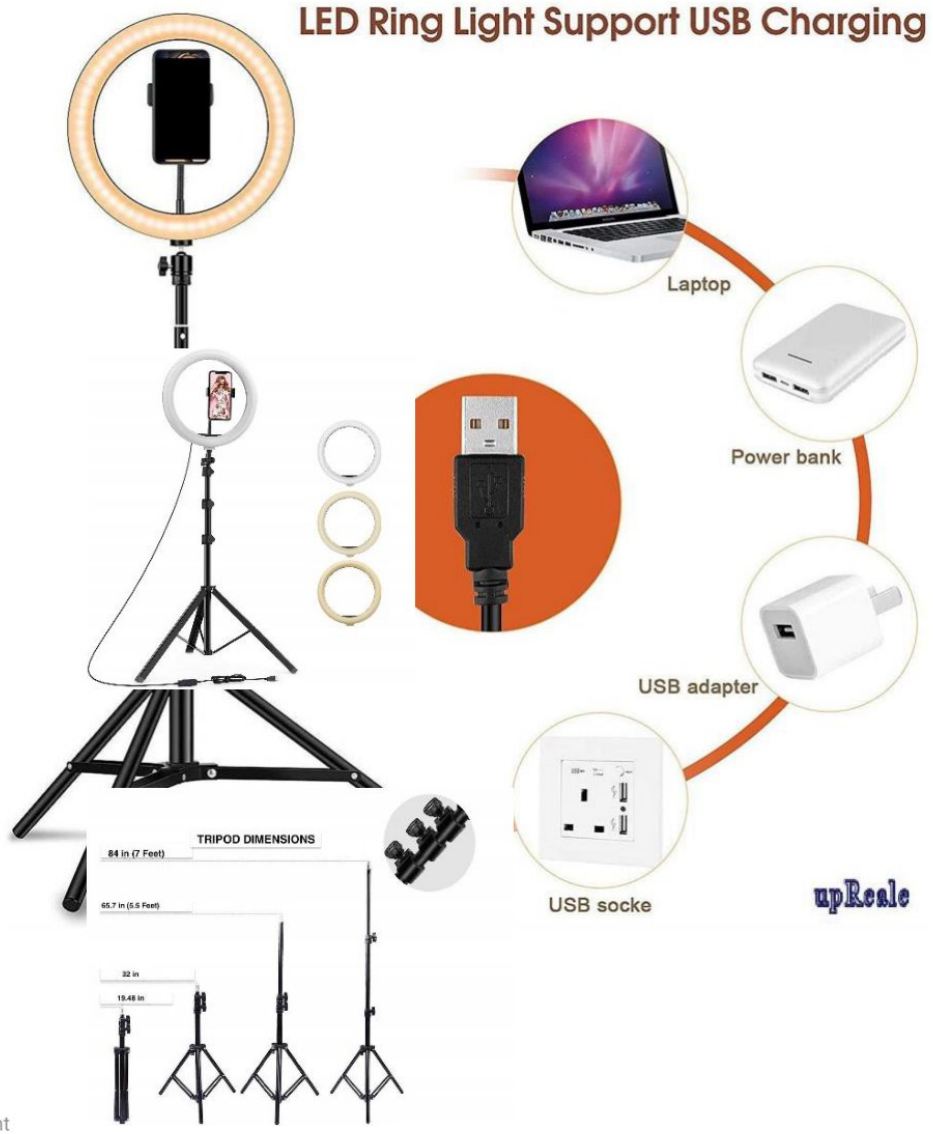


Fig 97 . Tripod with light

Equipment Details – Gooseneck Mobile holder

- Material – Silicone
- Mounting type – Table top
- Weight – 320 g
- Special features – Flexible , Gooseneck , adjustable arm

Fig 98 . Gooseneck tripod

06. Initial Design Brief

To make a **Customized Vlogging kit for YouTube Content Creators** which would suit their **Content making requirements** and would make the **Storage and Portability** much easier .

6.1 Area of Focus

As it was found that the art content creators as well as food recipe content creators face the maximum number of problems the design objective was taken forward by considering these 2 cases in particular . For deeper understanding of their recording environments , secondary research was performed.

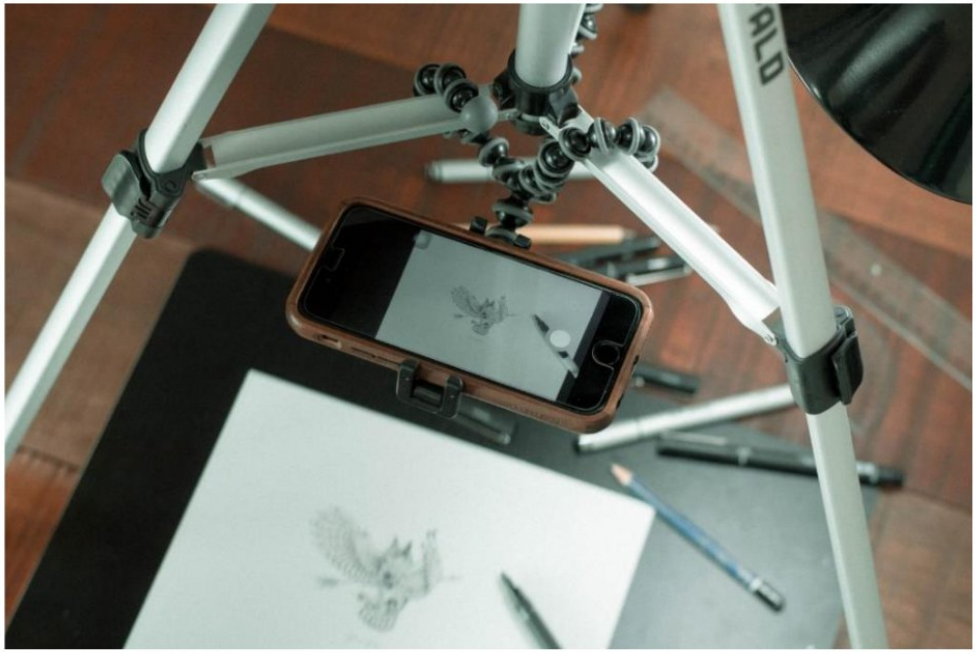


Fig 99 . Artist view

Art Content Creators

Fig 100 . Recipe view

Food and Recipe Content Creators

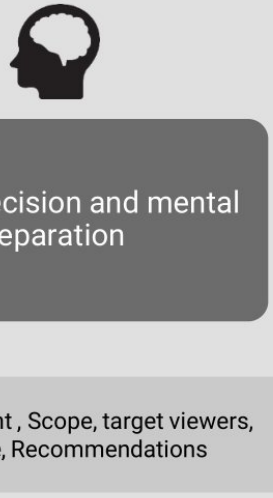
7.1 Primary Research

User journey Map

A Typical YouTube Video uploading occurs in 3 stages. They are -

- Preparation
- Recording
- Post processing

Stage 1
Preparation



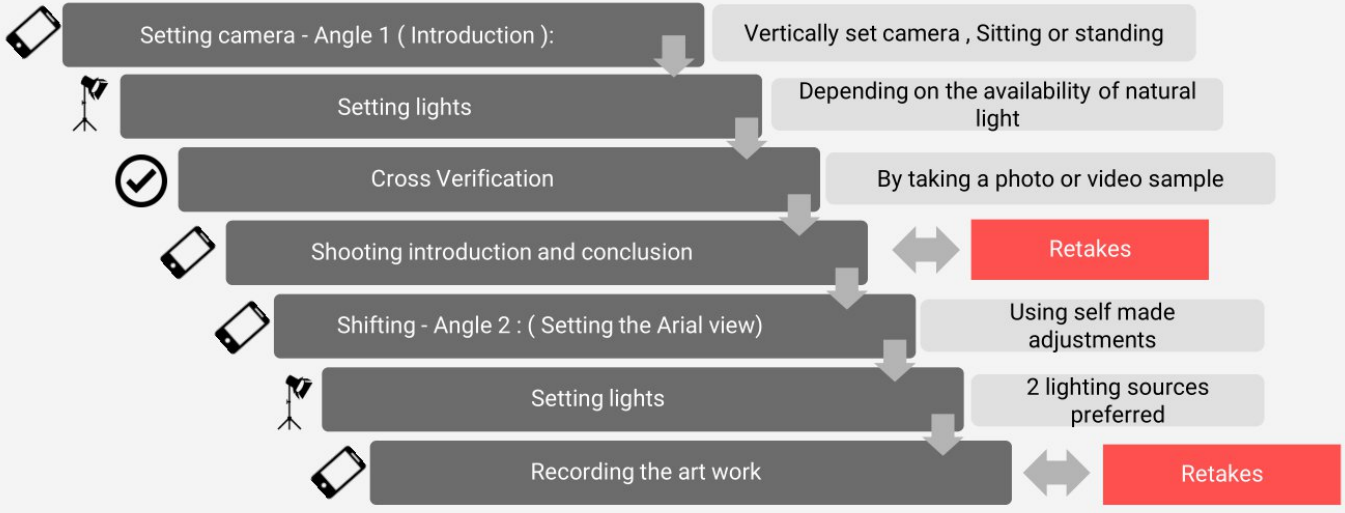
The Steps in this stage are the **same for both artists as well as Food Recipe Vloggers**

Stage 2
Recording

In the recording stage things are different. Compared to Recipe vloggers artist have lesser number of steps involved. They have to record from 2 different angles only. In between the videos they can be mistakes and the video often needs to be shoot again.

Art and Craft Vloggers

RECORDING



Stage 2
Recording

For the Food and Recipe content creators the recording stage itself has 2 sub stages. One is steady recording and the other is frequent camera shifting and recording.

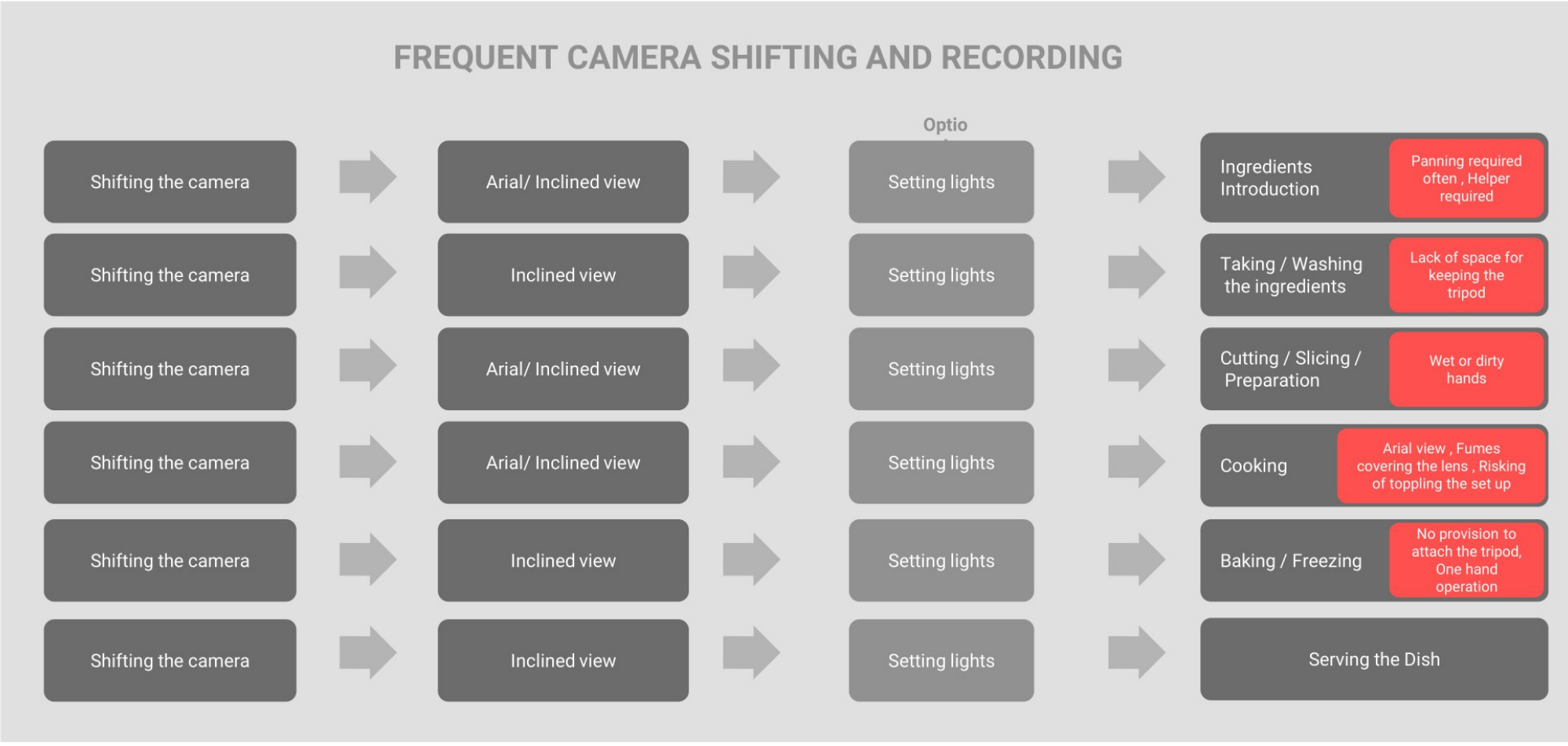
Food and Recipe Content Creators

STEADY RECORDING

Angle 1 (Introduction): Setting camera	Setting lights	Cross verification	Shooting Introduction and Conclusion scenes
Vertically set camera , Sitting or standing	Depending on the availability of natural light	By taking a photo or video sample	Later placed in sequence accordingly

Retakes

Food and Recipe Content Creators



Stage 3
Post Processing

This is the last stage once the shooting process is complete and the video is ready to be uploaded . This stage is also common for both the type of Creators

POST PROCESSING

Data transferring

USB , Drive transfer

Editing works

Activities – Arranging clips , selecting best video clips form retakes, adding voices , amplifying or de amplifying voices, adding background music, reducing noises, adding subtitles , short notes, links, descriptions, thumbnail , meme contents if any.

Softwares - Premier pro , Filmora , Inshot, Kinemaster etc

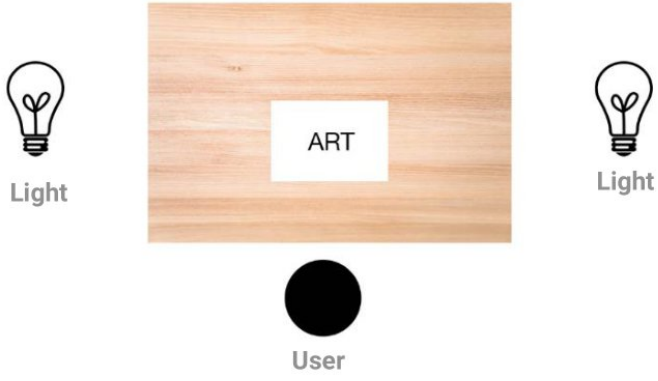
Done by – Children or husband or relatives in most cases

Uploading

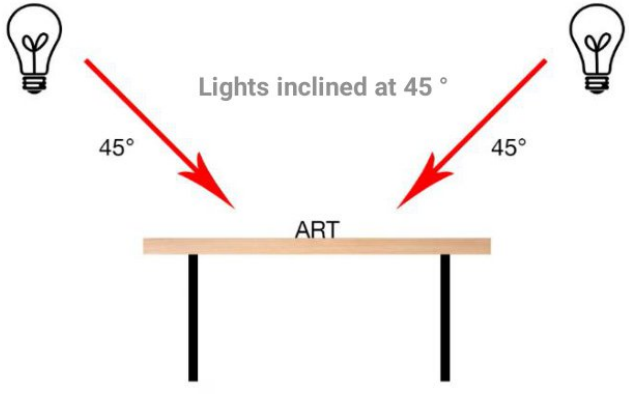
Video resolution – 1080p in most cases.

Ideal Lighting for shooting Art works

The picture shown below shows the ideal shooting conditions for a good art work video. From the top and side views it can be seen that the light should be coming at an angle of 45 degree from both sides so that minimum shadow occurs and proper lighting of the scene is obtained. When the light comes from the top or there is only one source of light shadow sharp shadows are formed making the video unpleasant.



Top View



Side view

The following picture shows the ideal setup of a professional artist with the lights are coming exactly at 45 degrees. In addition to this there is a top light also illuminating the scene and ensuring that the shadows are dispersed evenly and video comes out well.

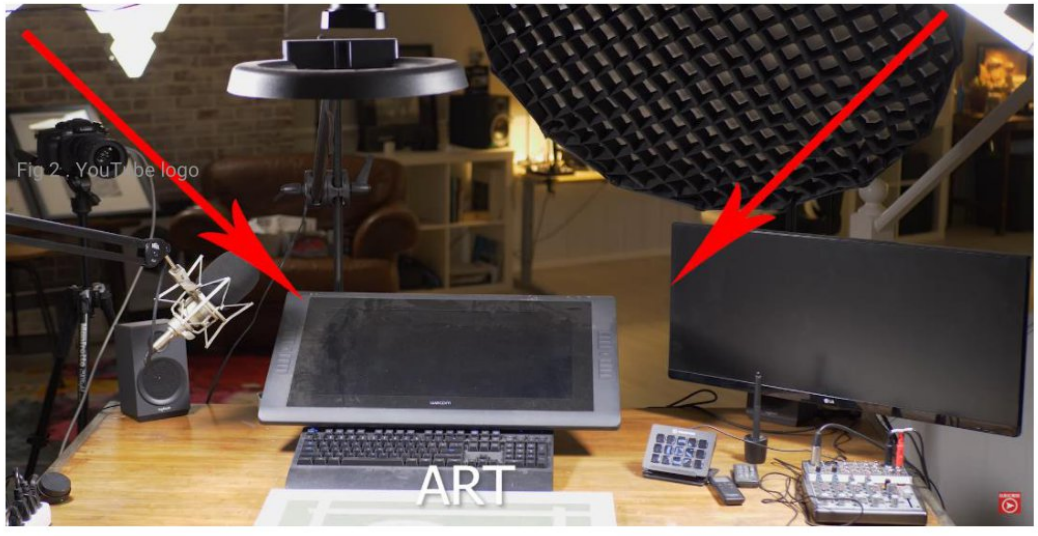


Fig 101 . Professional artist vlogging table

Additional Problems

Fig 102 . Artist problem

The picture shows an artist trying to capture his art work using a mobile phone .
it can be clearly seen that the menu ability of his hand is limited by the presence of the tripod and he's trying to shoot the video in Arial view.

Thus a typical tripod is unfit for this purpose as the user has to shoot the video from the top view.

7.2 Kitchen Types

Single Walled Kitchen

Old-fashioned and classy! Straight modular kitchens, on the other hand, are extremely convenient and simple to use. This kitchen layout allows for ample storage of all of your accessories and essential features. This concept clings to the basics and is a must-have for individuals who want simple aesthetics, as well as the convenience of cooking and dining.

Fig 103 . Single walled kitchen

L Shaped Kitchen

This form is best suited to small to midsize kitchens. To keep an L-Shape modular kitchen clutter-free and orderly, careful planning is required. In an L-shaped modular kitchen, creativity soars. The L-Shaped kitchen is ergonomically sound and creates a useful work triangle for food prep, cooking, and cleanup. Because this layout type necessitates an outstanding floor plan, this sort of kitchen design can be suited to any decor. The kitchen must be built at the corner where two walls make a perpendicular angle for an L-shaped design to operate. In addition, one section of the wall must be twice as long as the other.

Fig 104 . L shaped kitchen

U Shaped Kitchen

Three walls of a U-shaped modular design are lined with cabinets and appliances. This style of kitchen is a space-saving design that saves you money. It is the most practical kitchen layout and gives a lot of storage and appliance space. The 'Golden Triangle' design works well with a U-shaped modular kitchen because the fridge, sink, and burners are all within easy reach. This is an useful use of kitchen space that may be more difficult to execute in L-shaped kitchens and other galley kitchens. The most important benefit of a U-shaped modular kitchen is the safety component, as traffic will not impede your productivity.

Fig 105 . U shaped kitchen

Gallery Kitchen

Two narrow rows of cabinets facing one other with a tiny passageway in between constitute a galley modular kitchen. The galley plan complements any kitchen decor and improves cooking safety and efficiency. This style of kitchen layout can include multiple cupboards as well as doorways or walks at either end. All important appliances are stored in tall cupboards that run down the wall. To make the upper cabinet more connected to the ceiling, use a lighter color for the base cabinets and a heavier, darker substance for the base cabinets. This will also help you feel less like you're in a corridor. To make the area look more organized, try hiding the refrigerator and dishwasher behind cabinet panels.

Fig 106 . Gallery kitchen

Island Kitchen

An island-shaped kitchen accommodates all functionalities in a smart manner, spanning the full cooking area. It provides the host and visitors with a choice of comfort alternatives. Kitchen layouts with islands provide additional space for children to play and conduct homework, as well as making the kitchen a versatile environment. It also has greater storage space and is more well-ventilated

Fig 107 . Island kitchen

7.3 Self-made solutions

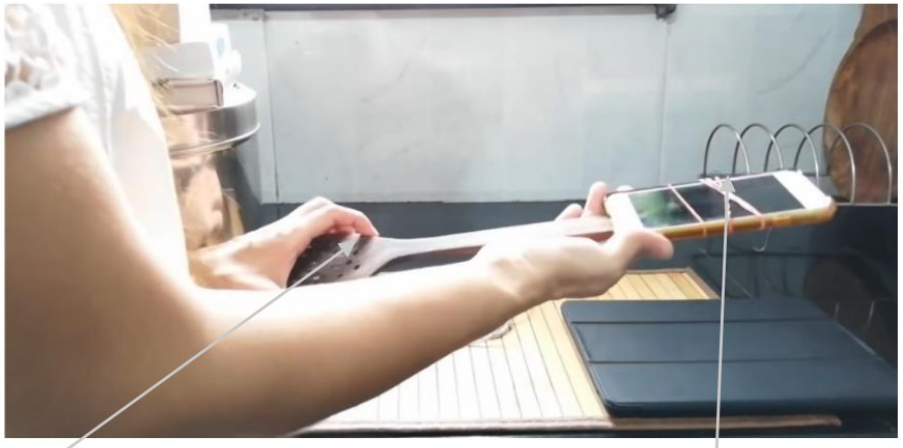


Fig 108 . Self made phone attachment

Fig 109 . Phone holder made

In order to get a top view view the user had tied the mobile phone to a wooden serving spoon using rubber bands A tin can and few books are used to attain the required height and the mobile phone is supported by heavy lid to record from the top

Fig 110 . Kitchen set up

Here another user can be seen using a suction holder to hold the mobile in the top view and also using a tin can to hold a gorilla tripod which shoots the cooking at an inclined angle . While shooting from the top from using this suction cup setup, the user is forced to change the views manually every time and shift the mobile to the required positions. This setup is also highly dependent on the availability of a shelf on top. In the absence of a shelf the user cannot fix the mobile in the required position.Also the tin and tripod combination takes up a lot of space on the kitchen top , limiting the workability of the user.

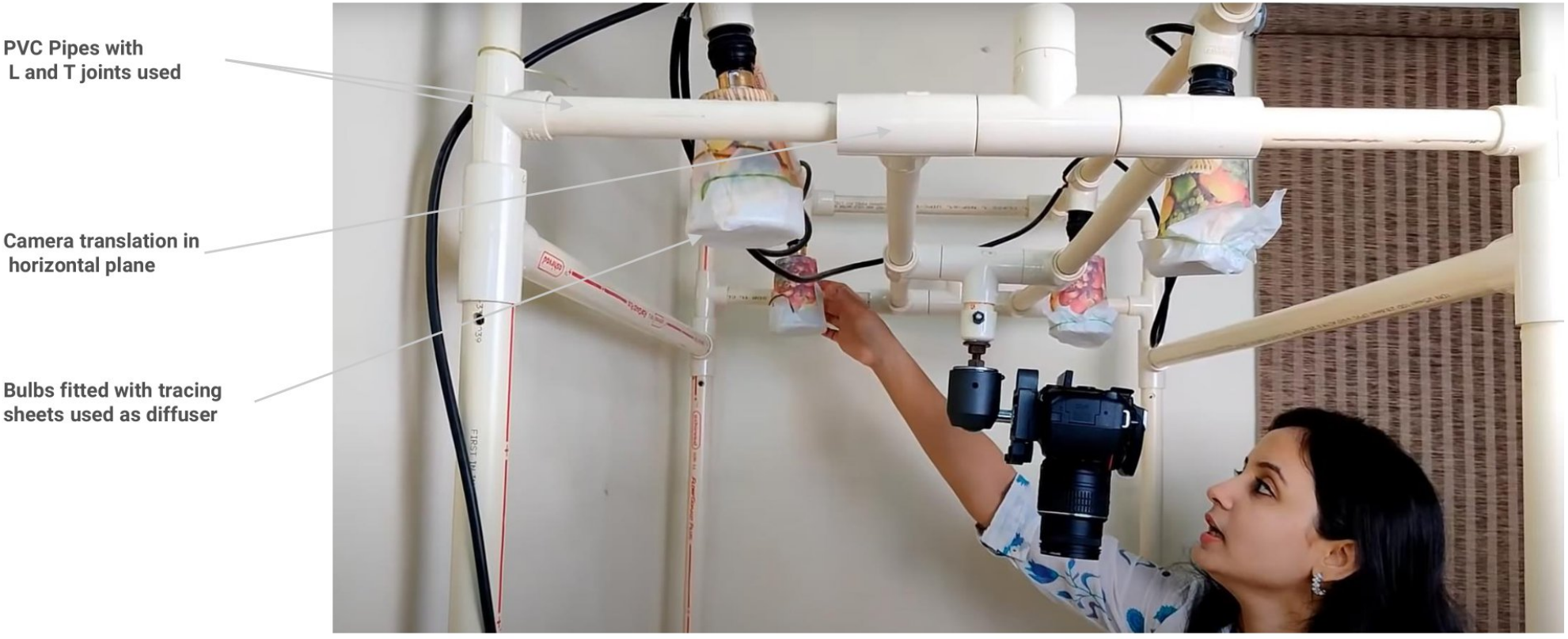
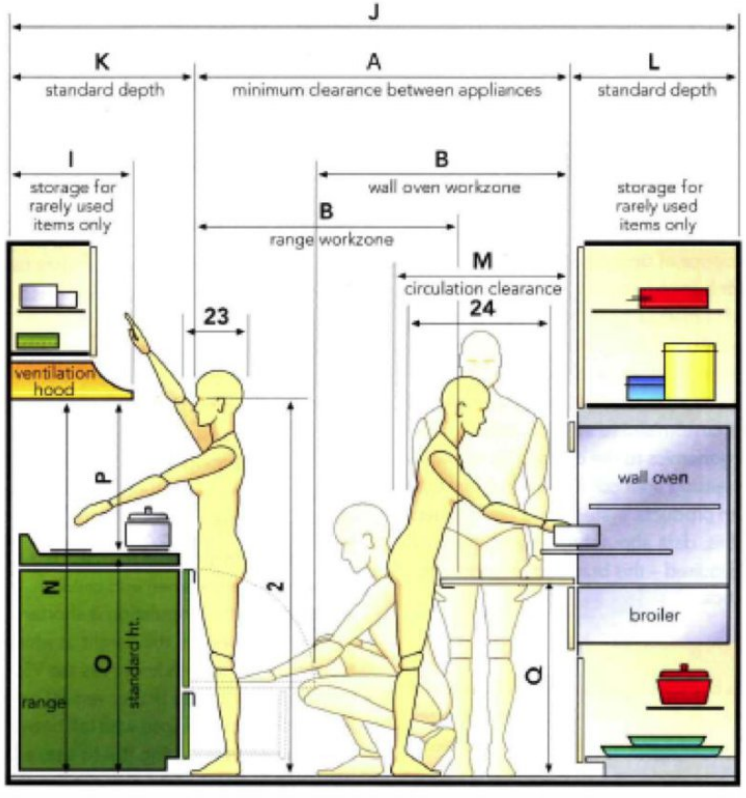


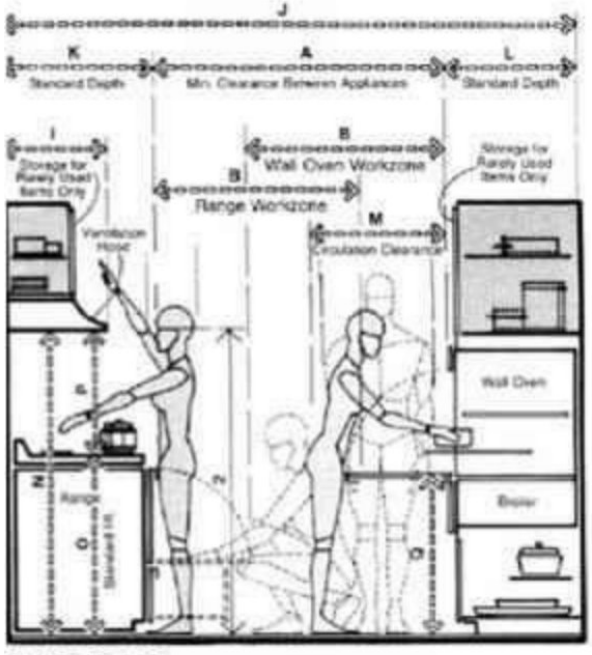
Fig 111 . Self made camera set up

The figure shows an innovative solution done by a user to tackle the difficulties in recording from the top. She has made a camera setup herself with the help of PVC pipes . The camera can move in both horizontal as well as vertical plane and record the video. L and T joints are used here to connect the PVC pipe and help in translation. She has used 4 bulbs for the lighting and covered them with filter papers to make the lighting diffused.

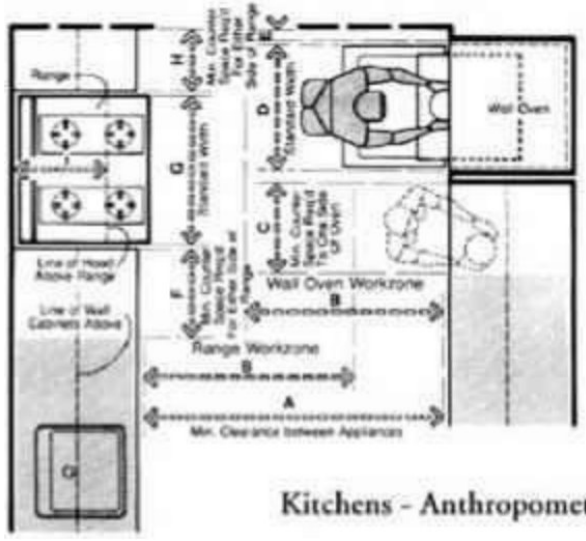
7.4 Kitchen anthropometry

The anthropometry dimensions of kitchen were carefully studied in order to understand the walkable area , the camera placement and user interactions happening.





RANGE CENTER



	in	cm
A	48 min.	121.9 min.
B	40	101.6
C	15	38.1 min.
D	21–30	53.3–76.2
E	1–3	2.5–7.6
F	15 min.	38.1 min.
G	19.5–46	49.5–116.8
H	12 min.	30.5 min.
I	17.5 max.	44.5 max.
J	96–101.5	243.8–257.8
K	24–27.5	61.0–69.9
L	24–26	61.0–66.0
M	30	76.2
N	60 min.	152.4 min.
O	35–36.25	88.9–92.1
P	24 min.	61.0 min.
Q	30 max.	88.9 max.

Kitchens - Anthropometric Data

Fig 112 . Kitchen anthropometry

08. Modified Design Brief

To make a **Customized Vlogging kit for YouTube Content Creators at a beginner or amateur level making Cooking videos or art videos using Mobile phones**

It should -

- Facilitate all the angles and directions intended
- Makes the overall process comparatively easier
- Minimizes the setting up and scene changing time
- Takes into account the storage and portability aspects of the products
- Adds more value to the product
- Avoids any external help if possible

09. Ideations

9.1 Ideation 1

Using End Connectors and String

In kitchen the whole process takes place in different areas ie. Introducing ingredients, cutting them, peeling, cooking , serving etc. So during the process the user has to constantly shift the camera. So the whole set up of camera and lighting can be made to move on a string connected at the ends on the wall.

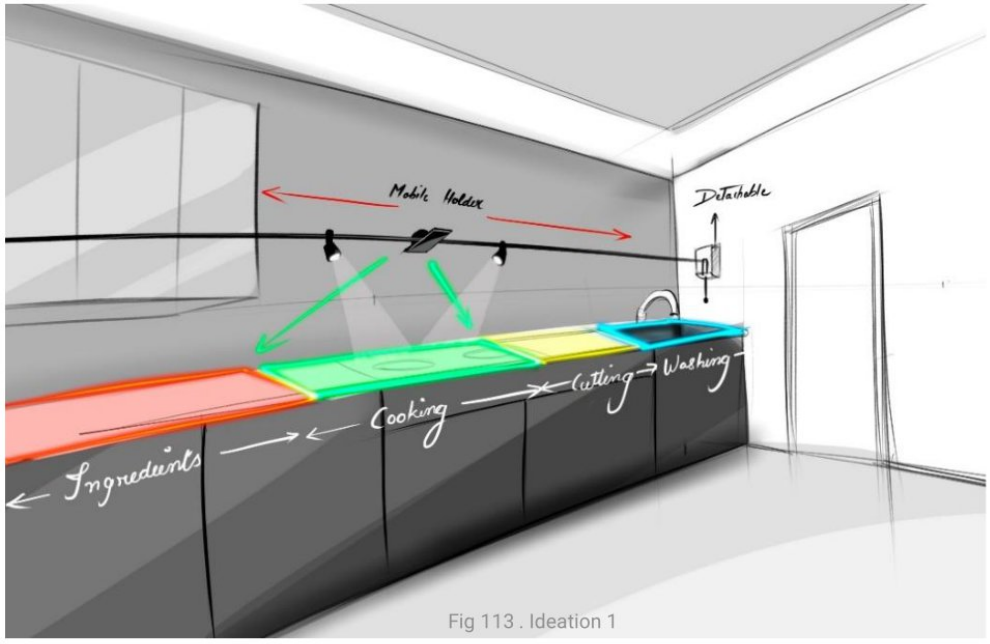


Fig 113 . Ideation 1

9.2 Ideation 1.2

Introducing railings on the end connectors

In the first ideation if railings are also attached to the ends, it will facilitate vertical movements too increasing the value of the product.

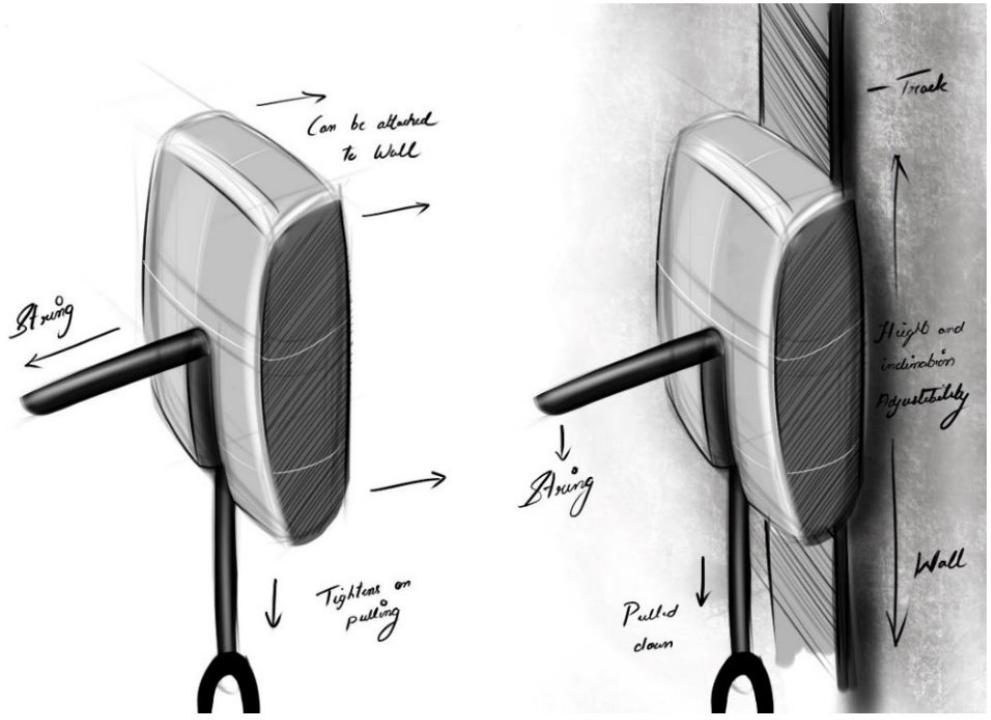


Fig 114 . Ideation 1.2

9.3 Ideation 2

Over the head and Around the Neck holders

This is best suited for cooking video makers .This arrangement can be used to shoot quick and short videos like mixer grinder scenes, opening and closing of freezer, oven etc. This setup doesn't require the use of hands and the user will be able to use both hands for working.

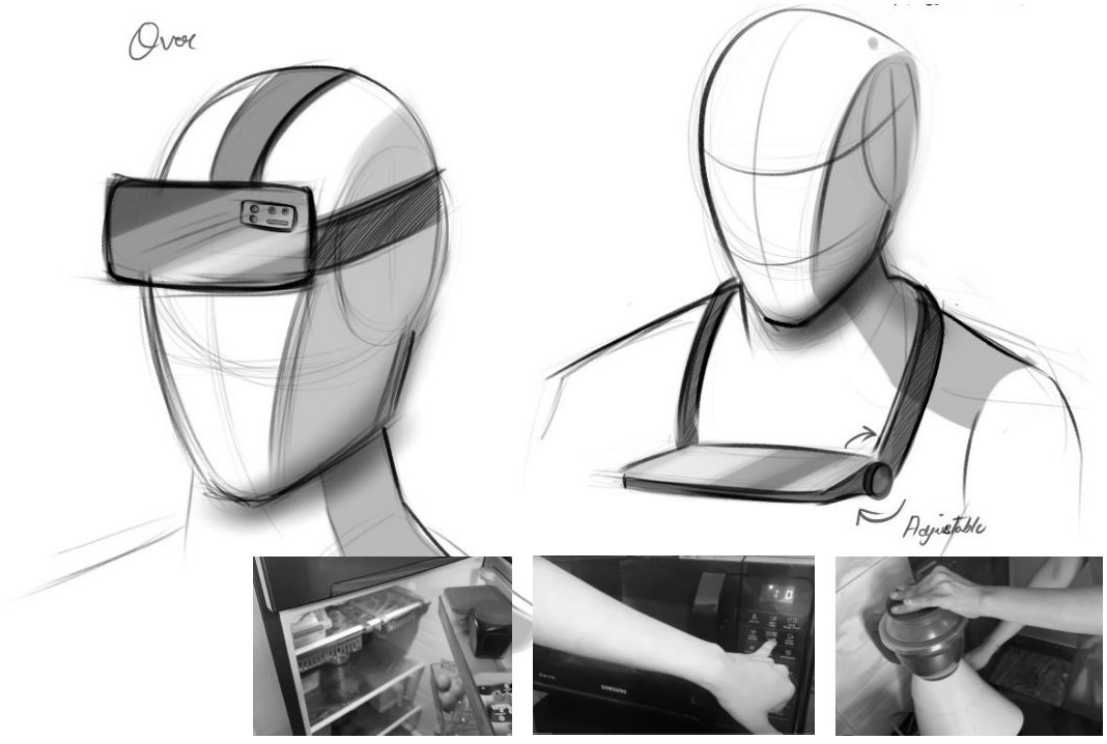


Fig 115 . Ideation 2

9.4 Ideation 3

Artist table

This set up is aimed at bringing the ideal art capturing set up. It has a mobile holder in the center which has a clamping mechanism and can capture top views. It also has 2 lighting set ups running along the sides of the table which is also slid able and height adjustable enabling the user to set it up asper his requirements.

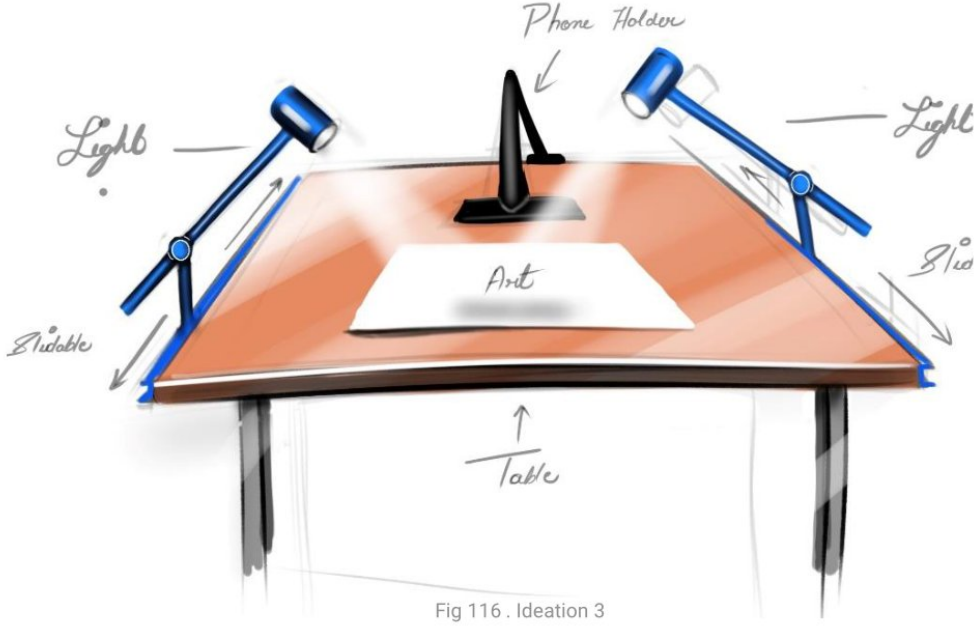


Fig 116 . Ideation 3

9.5 Ideation 4

Window mounted Holder

Here the whole arrangement can be mounted to an adjacent window and it can be adjusted above the table. These are best suited for art and craft vloggers. This set up can make effective use of the natural lighting available. It also has an attached lighting to illuminate the scene in case required.

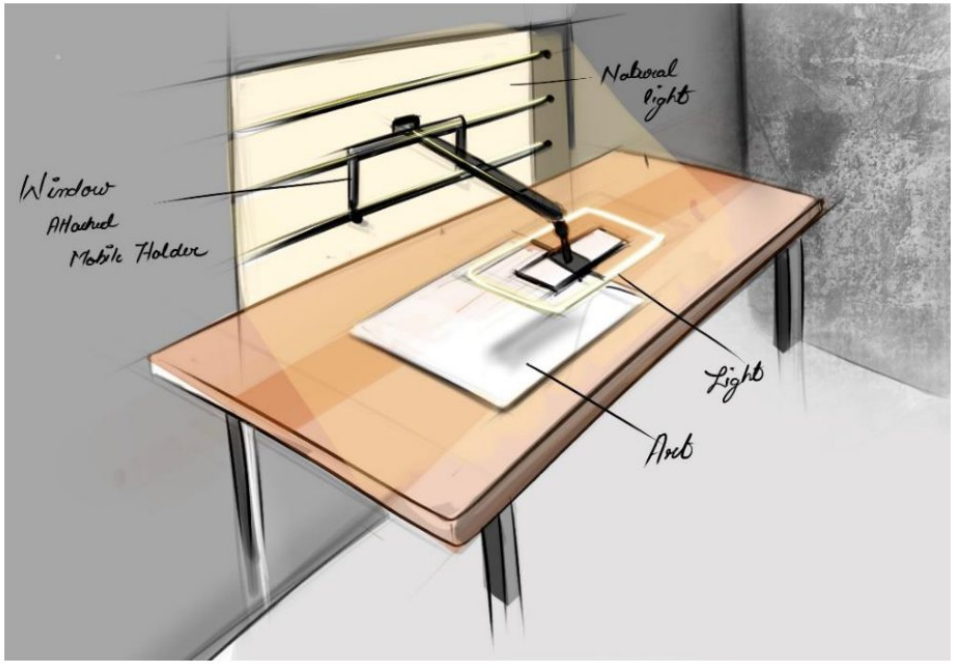


Fig 117 . Ideation 4

9.6 Ideation 5

Using Magnetic Connectors

Here magnets are used to connect the mobile phones to the holders. It is more convenient than screwing it and is much more time saving.

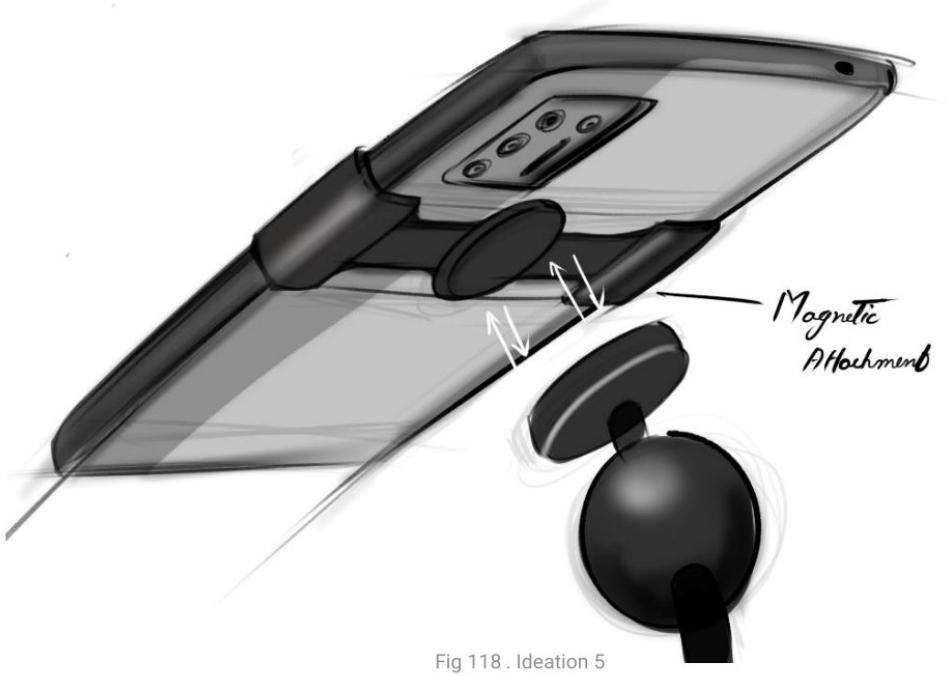


Fig 118 . Ideation 5

9.7 Ideation 6

Splitting tripod

This concept looks and can be used like a normal tripod. But it can have an additional feature that each of its legs are detachable and can be individually attached to a wall surface and have holders attached to all of them. Since the legs already have telescopic adjustable legs it can allow height adjustments as well. So the user can attach them on the wall where he intends to keep them and can use asper his requirements

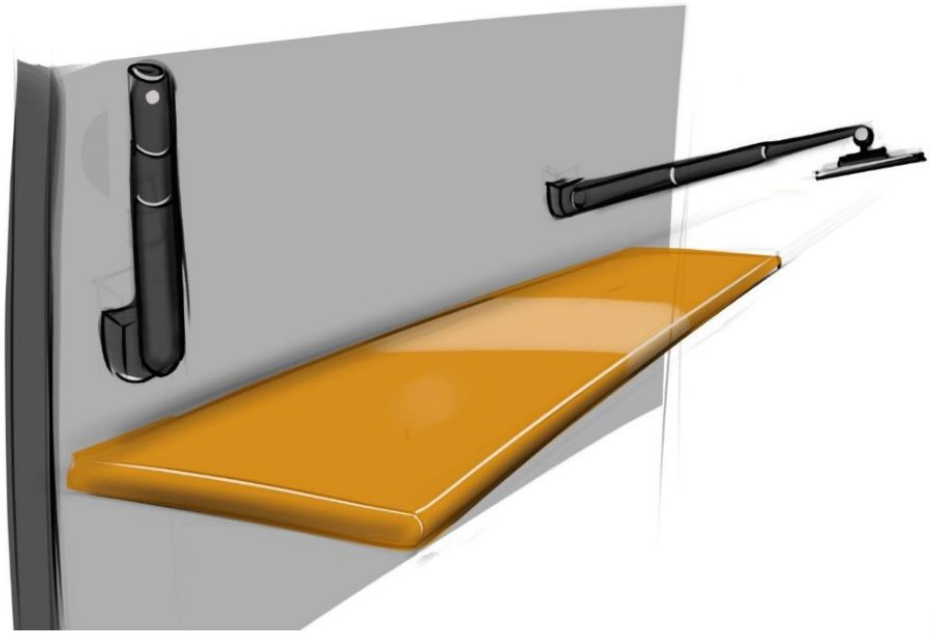


Fig 119 . Ideation 6

9.8 Ideation 7

Simple Table lamp Mechanism

This concept will have a simple table lamp like adjustment except the fact that it needs to screwed onto the wall. The legs are adjustable with hinged joints. The user can align the holder as intended and soot the videos. This is best suited for artists. This can be used by cooking vloggers as well but may not be able to cover the full kitchen top area.

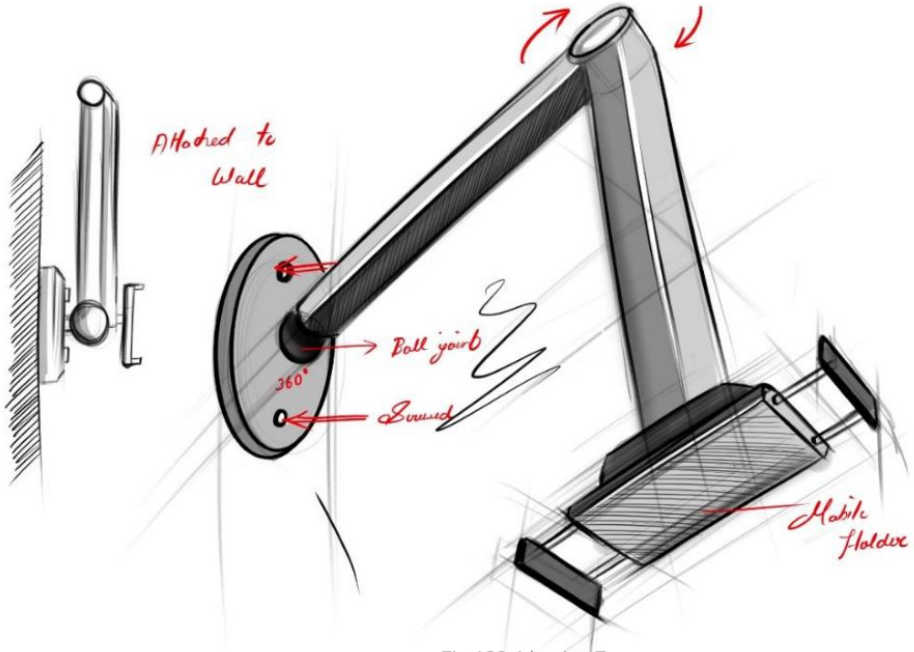


Fig 120. Ideation 7

9.9 Ideation 8

Using Suction cup attachments

This concept will have a rod which is supported at both ends by suction cups and can be attached to the bottom surface of the kitchen shelves. The camera and lighting can run over it and cover the shooting area.

But here the limitation is that the kitchen has different orientations and it might not always have a shelf right above the intended shooting area.

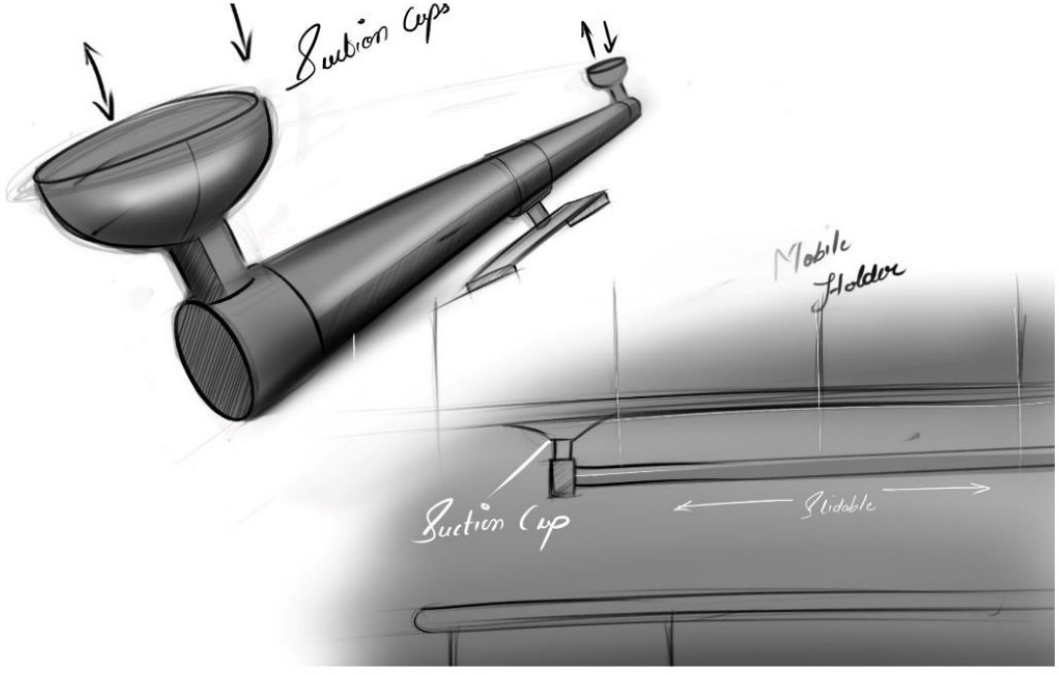


Fig 121 . Ideation 8

9.10 Ideation 9

Using Clamping Mechanism

This concept will have a rod which is attached to the kitchen shelves by slightly keeping it open. This mechanism is stronger compared to the suction mechanism. The camera and lighting set up can run over it. But again this is limited by the availability of kitchen shelves at the top of the intended shooting area.

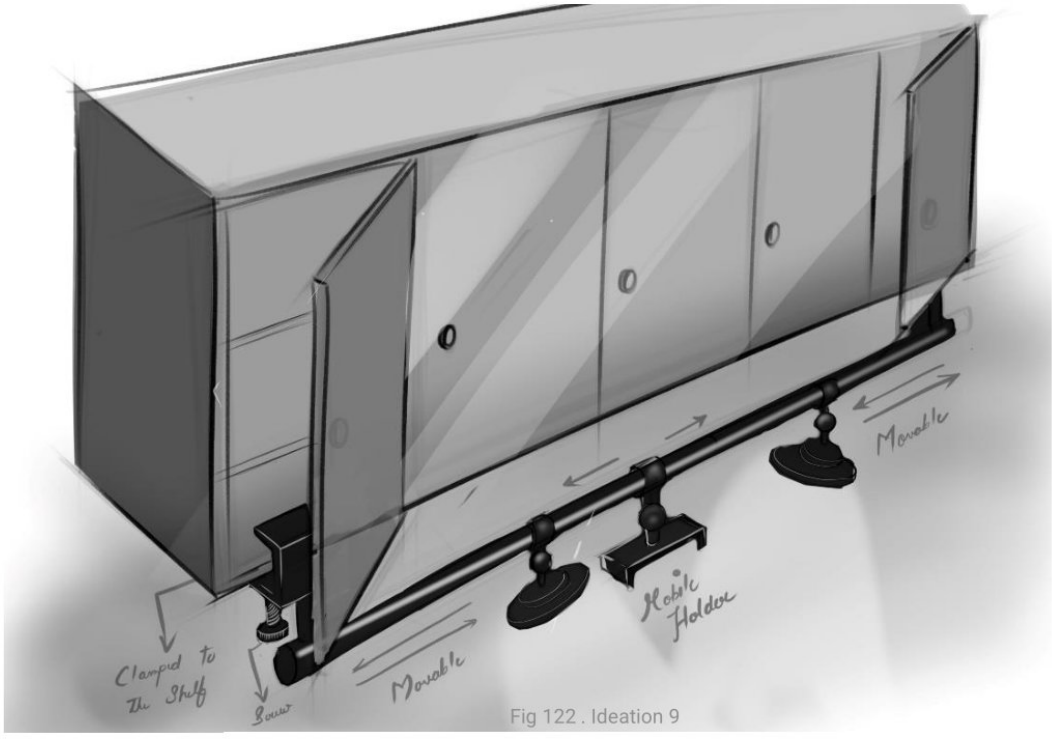
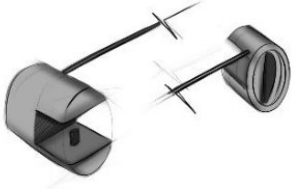


Fig 122 . Ideation 9

9.11 Ideation 10

Using string connectors

Here a string is controlled by 2 end connectors which will have a recoiling mechanism and they can be attached to wherever intended. There will be a tightening mechanism to hold them firmly. The camera can follow the path set by these connectors



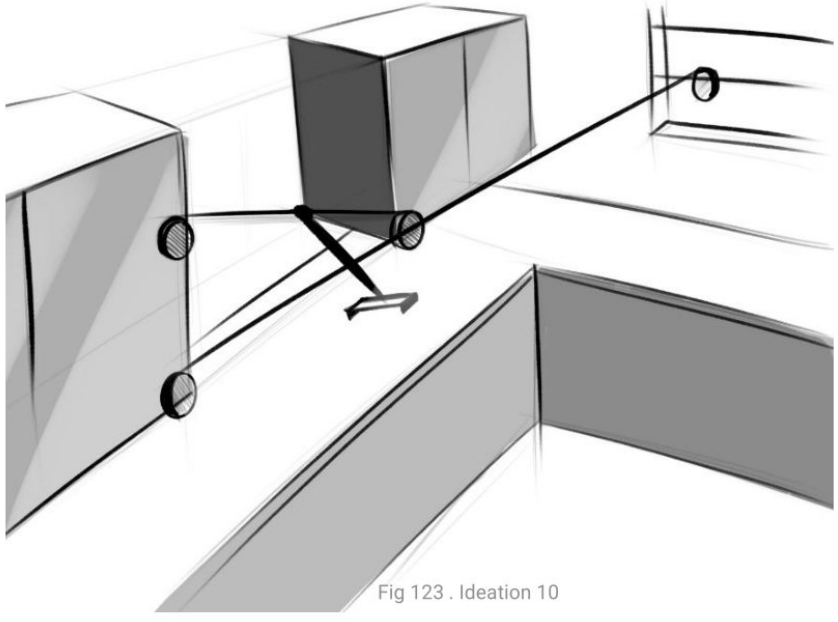


Fig 123 . Ideation 10

9.12 Ideation 11

Sliding fan Mechanism

While shooting from the top view the cooking fumes can come up and cover the camera lens. This makes the video blurry. The hot fumes can get condensed and stick to the lens making the video more unclear.

So in order to rectify this, this concept has a slid able fan running along the periphery of the camera lens. It should be movable as different phones have cameras on different portions.

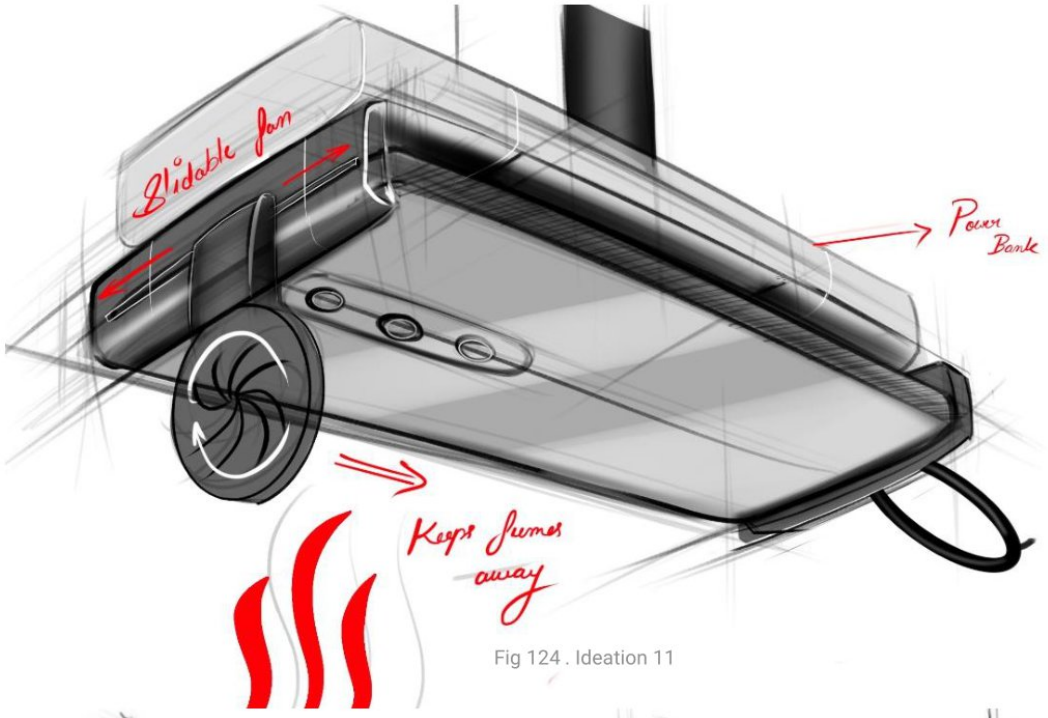


Fig 124 . Ideation 11

9.13 Ideation 12

Magnetic Holders

Here the holders are held in position using magnets attracting each other and they can be attached to both horizontal as well as vertical surfaces of the shelves given that they are available in the vicinity.

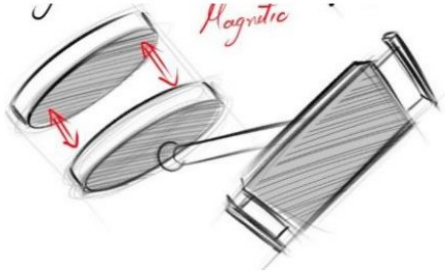


Fig 125 . Ideation 12

9.14 Ideation 13

Bending pipe Design

This concept aims at arts and craft vloggers where a steel tube coming form the bottom bends over on top of the artwork to get an Arial view. It is rotatable to some extent and will have lights that slides to and fro and can be adjusted asper the user intends

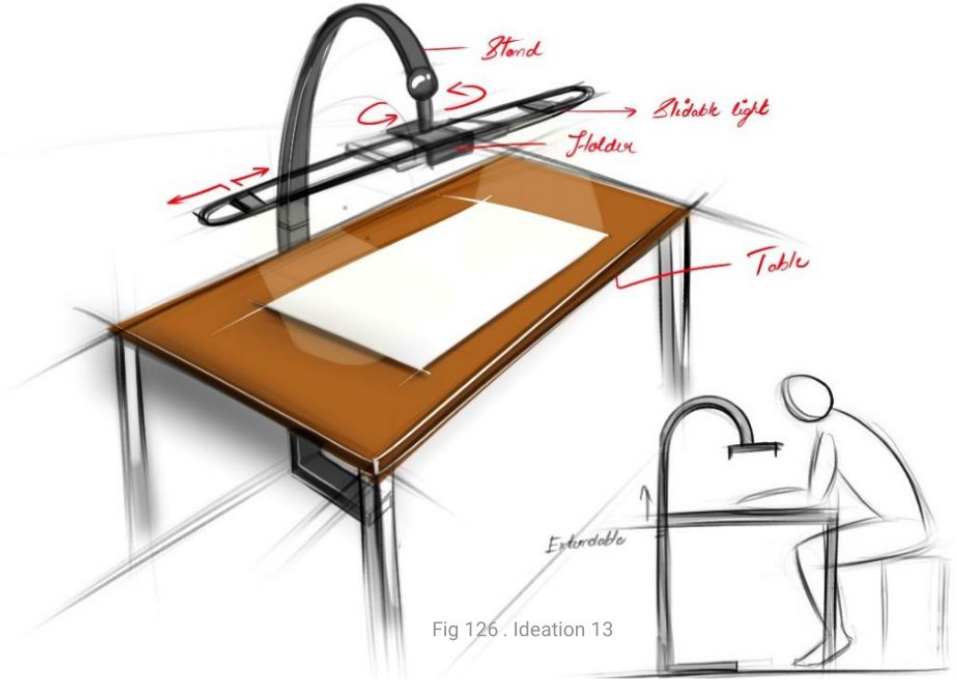


Fig 126 . Ideation 13

9.15 Ideation 14

Sliding Rail Mechanism

Here horizontal and vertical railings are attached to the wall and the camera and lighting slides on a pipe that allows both vertical and horizontal movements.
The user can adjust the camera and lightings using a single hand itself. It will have cylindrical lightings which wills slide on the tube and illuminate the scene.

Fig 127 . Ideation 14

9.16 Ideation 14.1

Rotating rail Mechanism

This is a slightly modified concept of the previous one. Here there are no separate railings for horizontal and vertical movements. Instead, they are replaced by a rotating rail which has a center pivot. It gets auto- adjusted in the required orientation when the user adjusts the position of the camera as required.

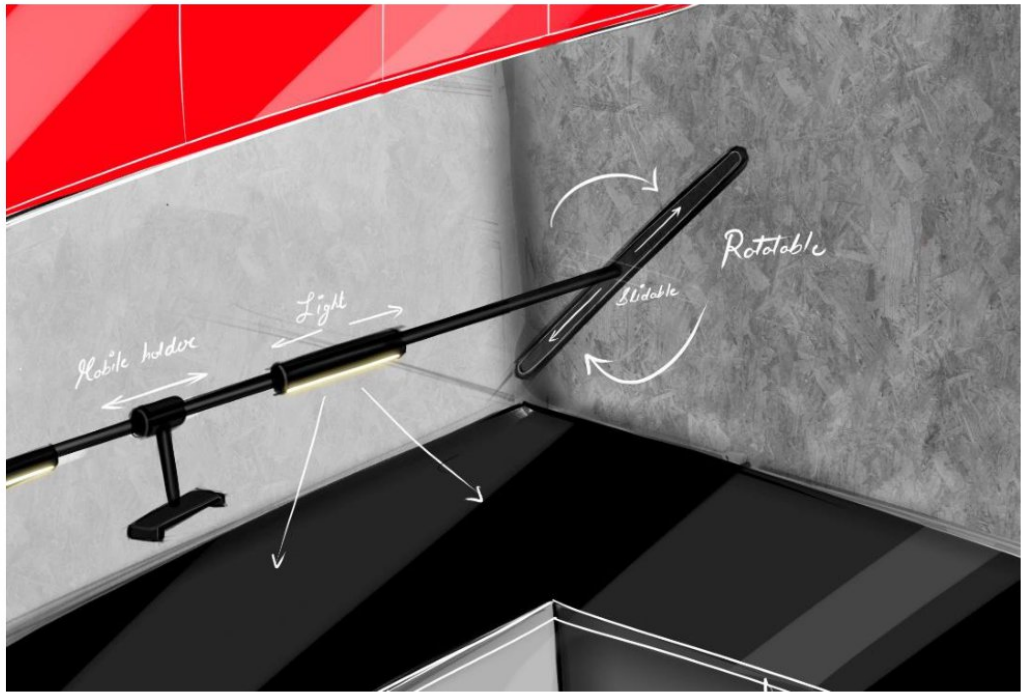


Fig 128 . Ideation 14.1

9.17 Ideation 15

Hanging Pipe Design

In this concept the entire set up is hung from the top using a string which is connected to a steel tube that is attached to both sides of the wall. The tube is collapsible form both sides which can be extended by rotating the center portion of the tube.

On rotation the 2 end of the tube extends outwards and touches the walls of the room. On further tightening the grip becomes firm and the device can rest on the walls without the string support and it becomes firm and steady. The user can now comfortably slide the camera and lightings over it and record the video

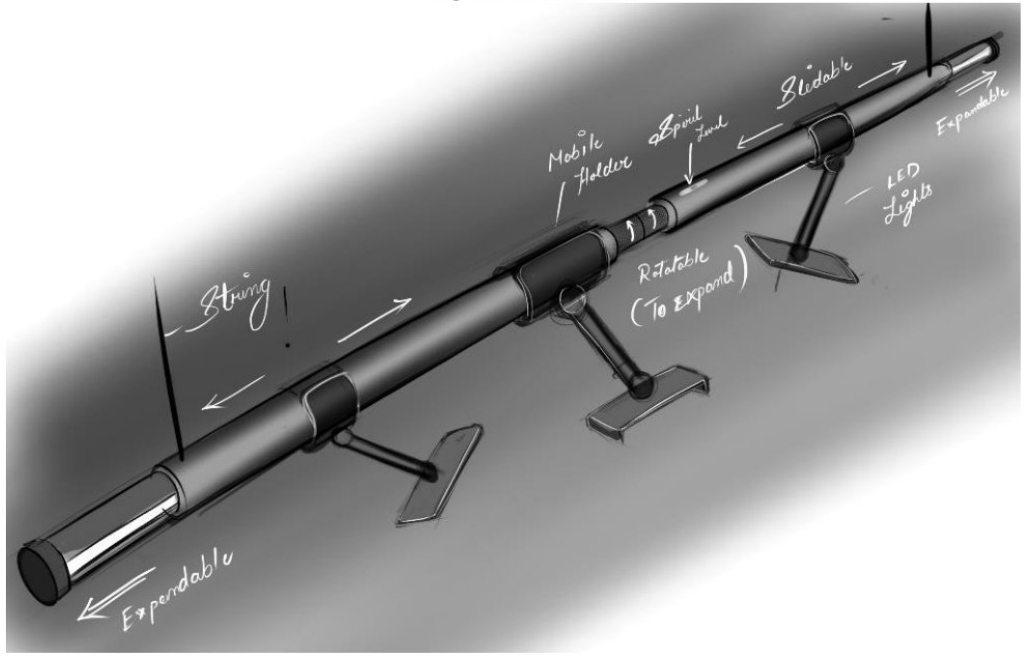
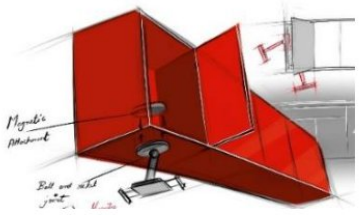
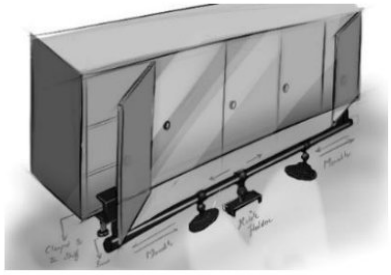


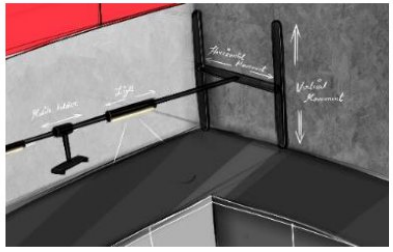
Fig 129 . Ideation 15

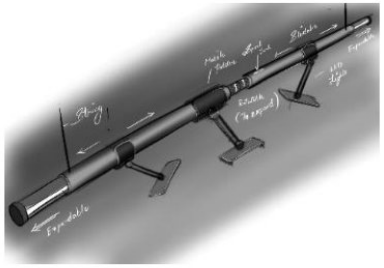
9.18 Concept Comparison

Out of the many ideations made , 4 of them were chosen and compared in order to find out the best one for making mock ups and carrying the design forward. Several factors considering the usability of the product were analyzed carefully.







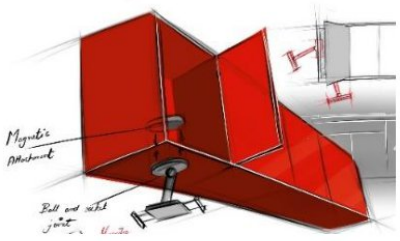
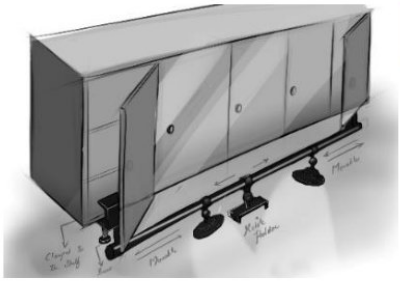
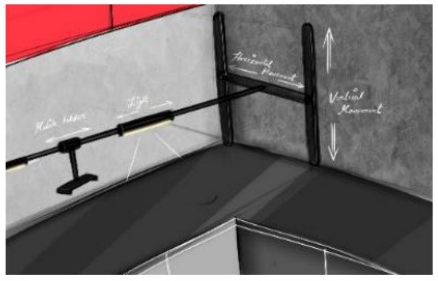
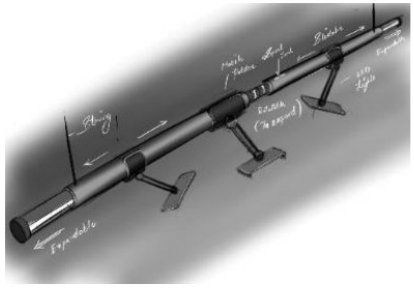


Concepts	Magnetic Design	Shelf Clamping Design	Railing Mechanism Design	Hanging pipe Design
Type of Attachment	Temporary	Temporary	Permanent	Permanent
Method of Attachment when in use	Magnetic attachment	Clamping	Sliding	Compression
Suited for	Food Recipe Videos	Food Recipe Videos	Food Recipe Videos	Both
Storage when not required	Stored separately	Stored separately	Slid near to the wall	Goes up beneath the ceiling
Dependency while in use	Kitchen shelves	Kitchen shelves	Wall	Any Vertical necessarily strong support
Integrated lighting	No	Yes	Yes	Yes
Portability	Portable	Portable	Not Portable	Portable
Size	Small	Medium	Large	Large
Collapsibility	No	Telescopic joints	No	Telescopic joints
Secondary uses if any	No	Hanging light object if alternate fixing surface available	No	Ambient Lighting
Single hand operation	No	Yes	Yes	Yes

Upon comparison it was found that the **hanging pipe design** had the maximum benefits.

9.19 Concept Evaluation

After concept comparison the selected concepts were evaluated based on various factors and points were allotted out of 5

Concepts	Magnetic Design	Shelf Clamping Design	Railing Mechanism Design	Hanging pipe Design
Functionality	3	3	4	4
Compactness	4	3	1	2
Collapsibility	1	2	1	3
User friendliness	3	3	4	4
Storage	4	2	1	3
Time efficiency	2	3	5	4
Portability	4	3	1	2
Safety	2	3	4	3
Independency	1	1	1	3
Effortless camera position Shifting	1	3	4	4
Value addition	1	2	1	4
Secondary use	1	2	2	3
Total	27	30	29	38

After the evaluation it was found that the was that the **Hanging pipe Design** scored the maximum.

9.20 Concept Development

The chosen concept was taken forward and more detailed sketches regarding the fitting and usability aspects of the product were done.

The hanging pipe design would be designed in such a way that it would rest at the top as an ambient lighting when its not in use. It can be pulled down in same manner as pulling down a blinder and then after it comes down it can be attached to the walls by rotating at the center

Fig 130 . Hanging pipe concept

As it comes down in a collapsible form and extends outwards it wont disturb the neighboring shelves.

Method of attachment

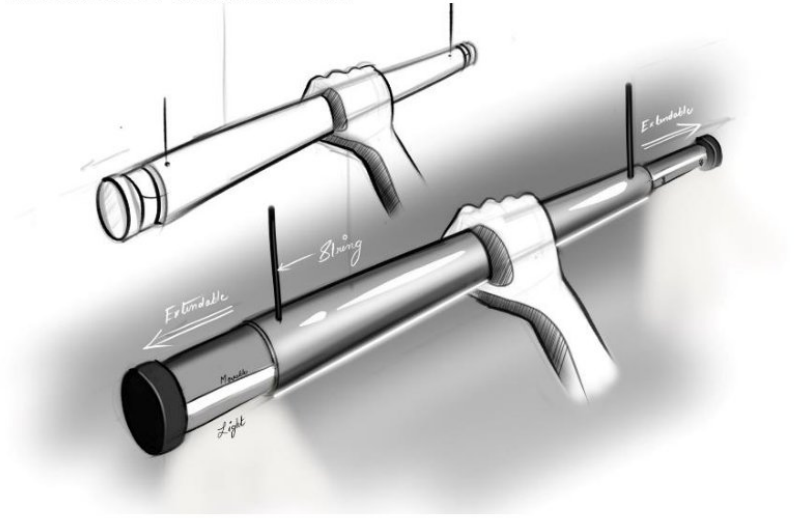


Fig 131 . Hand on device

The extendable portions press against the wall upon rotation in the center and makes the device firm using compression.

Fig 132 . Tightening mechanism

This works in the manner as fitting a pull up bar designed to be fitted at the doorway. It becomes strong enough to withstand the weight coming on it.

The user working in the kitchen can simple pull down the string to bring the device down.

Fig 133 . Usability 1

Fig 134 . Usability 2

As it comes down in a collapsible form and extends outwards it wont disturb the neighboring shelves. This concept was initially designed to be hung from the ceiling. But it was later changed to a support attached to the walls. And this support holds the device. This change was made because it was difficult to attach anything on the ceiling compared to the walls and people would prefer that more.

A blinder mechanism ensures that the device is coming down in a levelled manner and is parallel to the kitchen top.

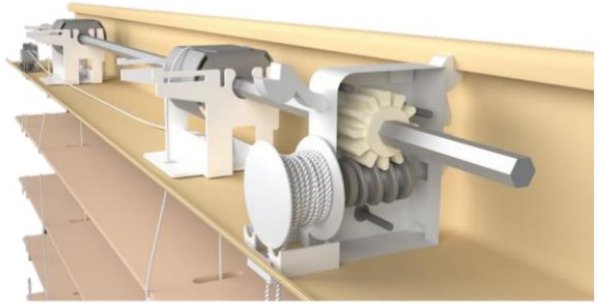
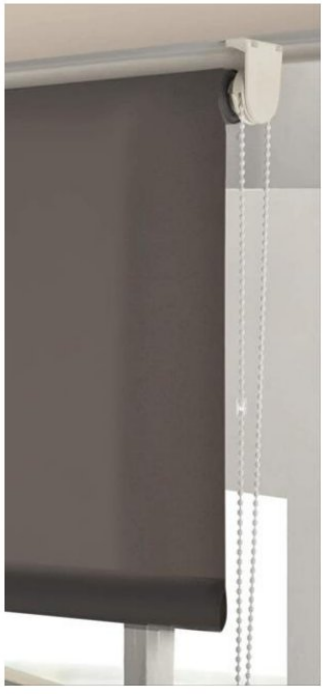


Fig 135 . Mechanism

The device could be even detached and moved to a separate wall if necessary and depending on the kitchen layout. There would be spirit levels on the device to ensure correct levels.



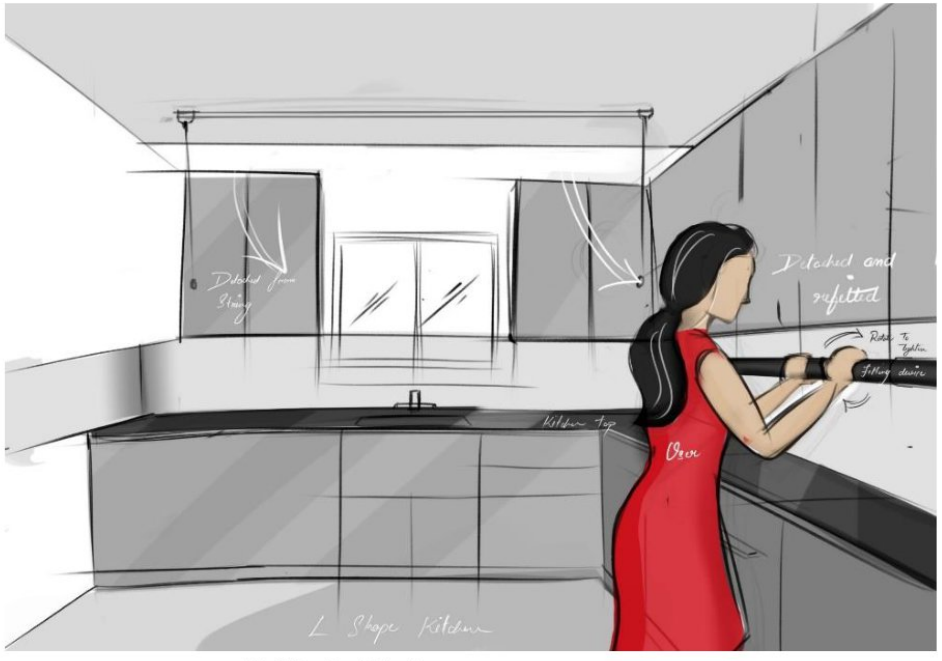


Fig 136 . Usability 3

This deign can be used by an artist as well by attaching the device on the intended area above the table and lowering it when required. As it has a strip light below the tube external lighting may not be necessary in some cases.

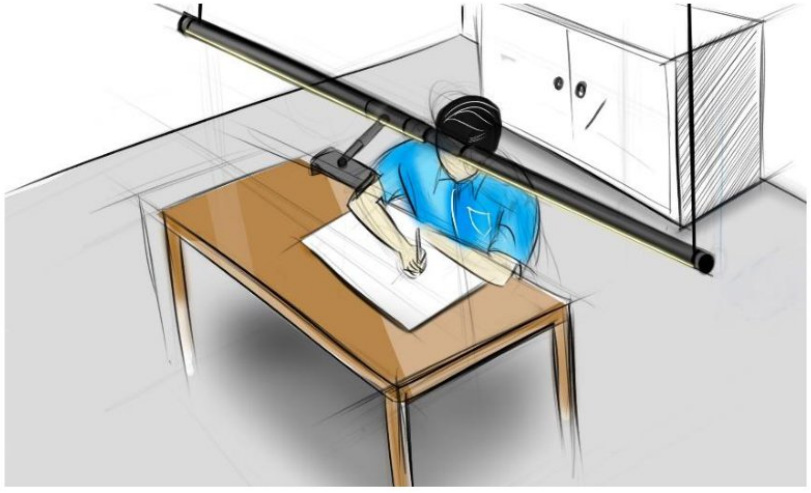


Fig 137 . Artist using design

9.21 Concept Detailing and additional features

Method of attachment

The supporting tube can be made of Aluminum and will have an inserting mechanism as shown

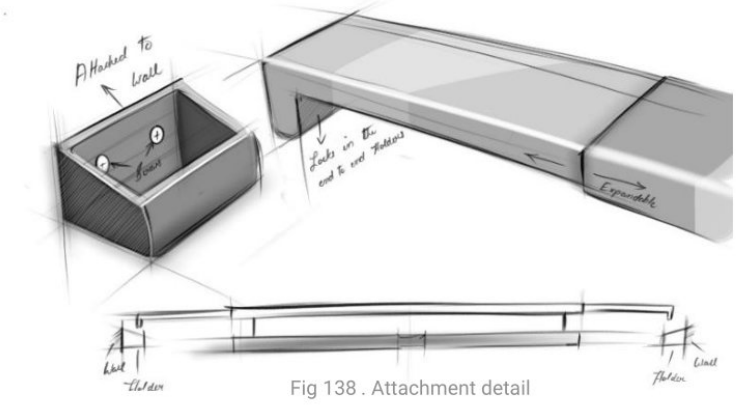


Fig 138 . Attachment detail

Rotatable and sliding lights

The movable lightings would be such that they remain on top off the main tube and it will be Invisible when looked up from the bottom . They can be rotated and brought down as when required by the user

Fig 139 . Lighting detail

Magnetic attachment and Mirror Concept

In order to decrease the complexities the attachments would be fully magnetic so that the user can easily attach the mobile phones . It will also decrease the number of steps compared to a typical screwing mechanism. A mirror will also be attached to the device so that the user can see a reflection of what is being recorded from an angle which is about the eye level.

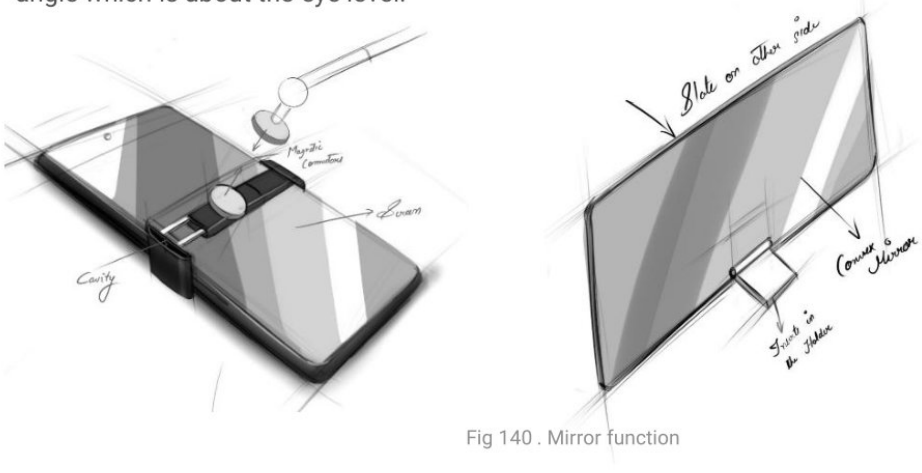


Fig 140 . Mirror function

Erasable slate at the back

The back of the mirror is an erasable slate in which the user can write the main keywords and refer to it while recording the video. It will be placed in such a way that it is not very obvious that the user is referring a note.

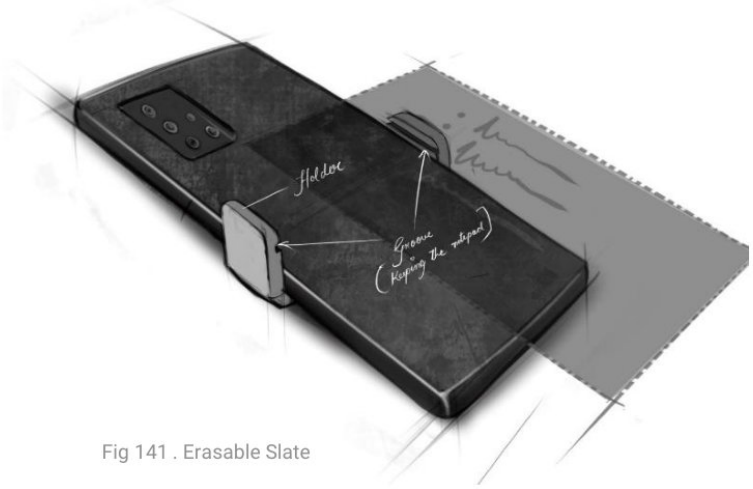


Fig 141 . Erasable Slate

Fan to keep the fumes away

A fan would be attached to the whole setup so that the cooking fumes can be blown away by the fan and it does not interfere or blur the video.

Fig 142 . Fan mechanism

Holder Mechanism

The mobile holder holds the mobile from the back using a magnetic attachment and can orient in any manner as required by the user

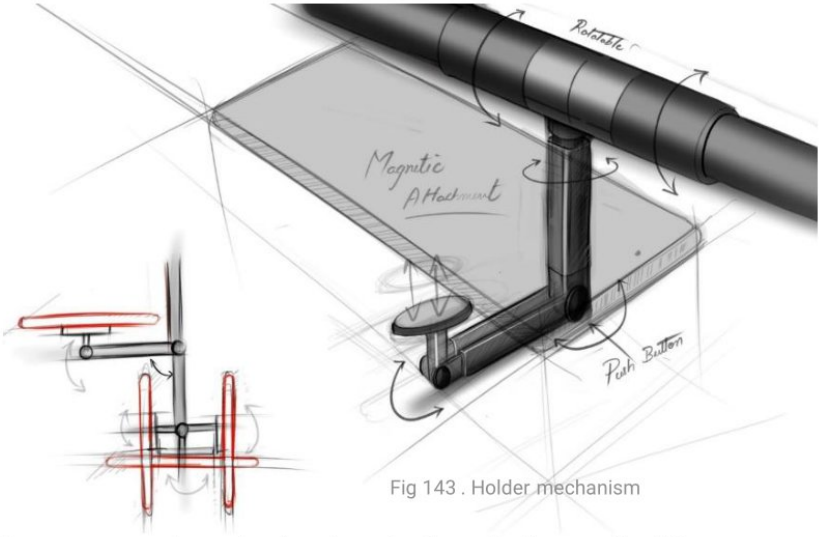


Fig 143 . Holder mechanism

It can also be a gooseneck mechanism in order to make it more flexible

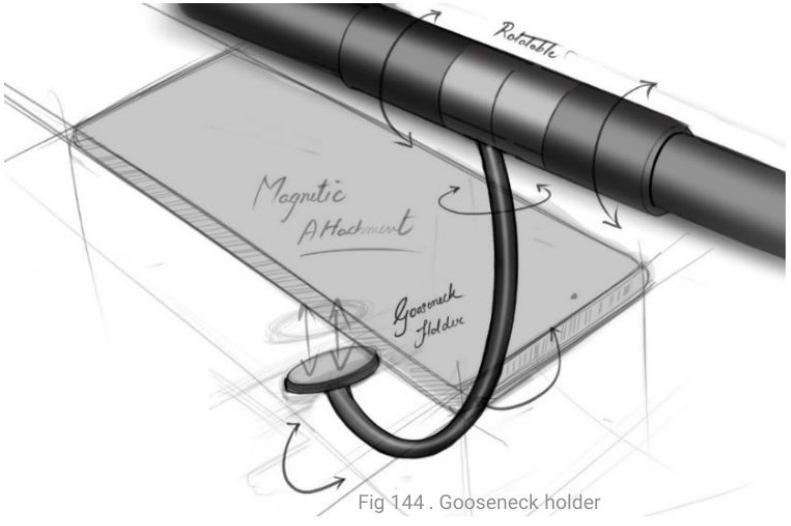
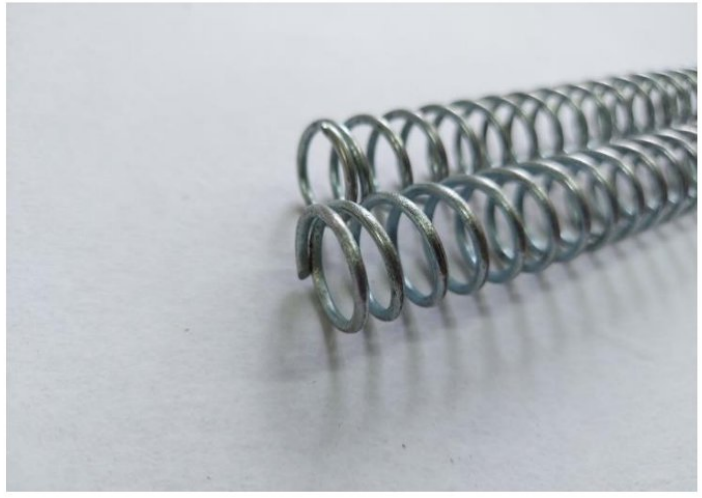


Fig 144 . Gooseneck holder

10. Mock up – Hanging pipe Design

Materials used

Pipes – PVC and Metal



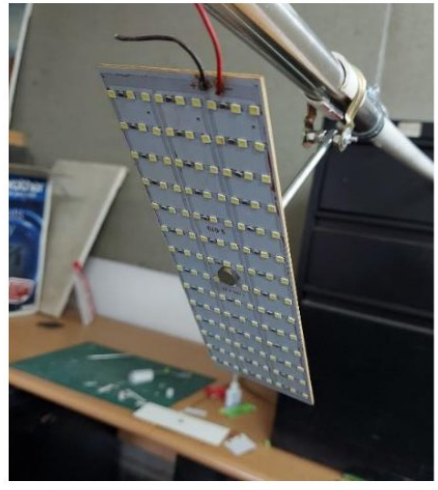
Springs

Rubber Stoppers

Ball and Socket Joint

Tightening rings

Magnets



LED lights

Fig 145 . Mock up materials

A mock up was made using steel and plastic pipes and was hung from the top using a support . It could hold also hold onto to the walls when it is elongated as in the design. The compressive force was achieved using springs . The other detailing are shown below. The phone attachment was by attaching a magnet to mobile holder which had a ball and socket joint in order to facilitate every angle.

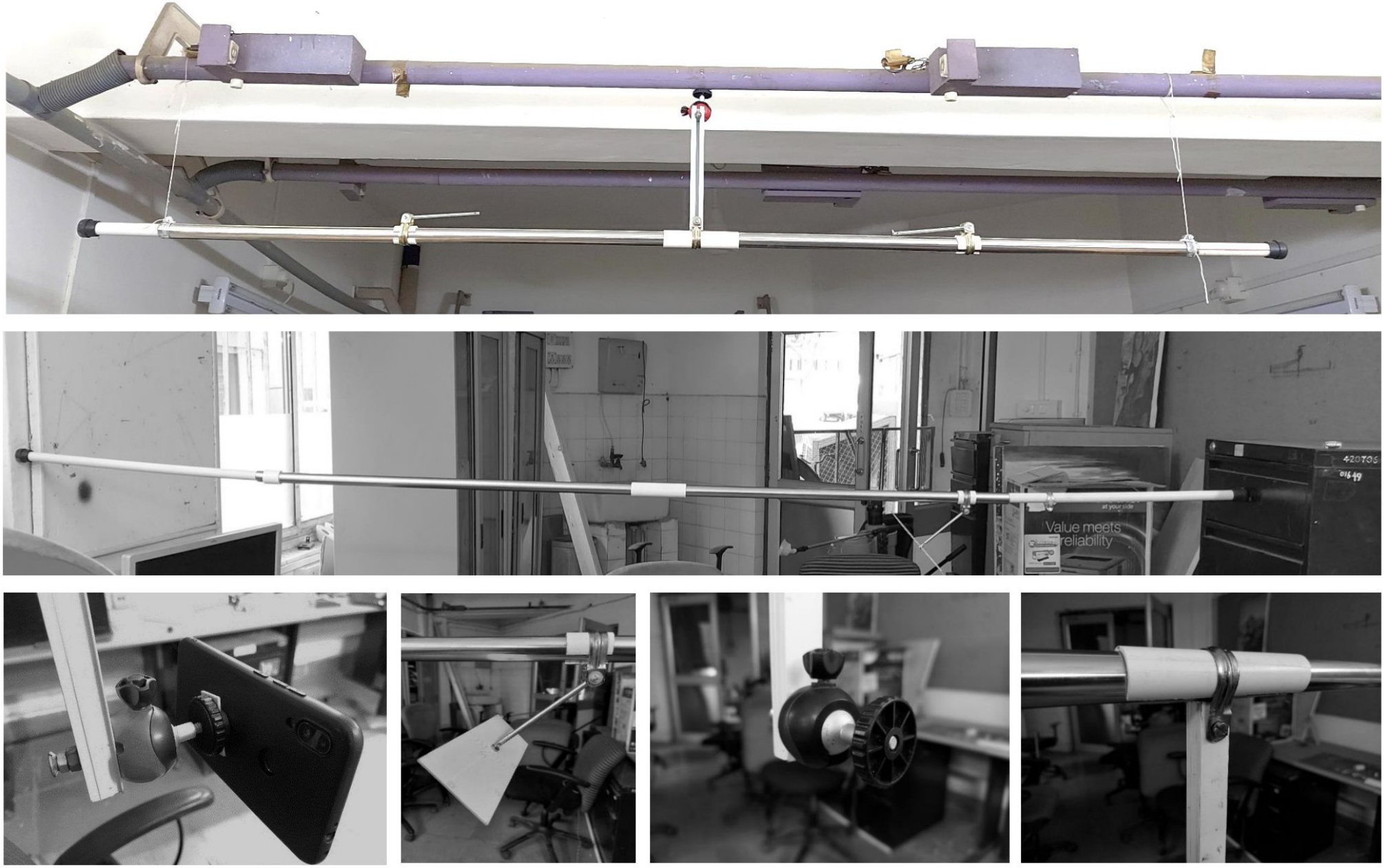
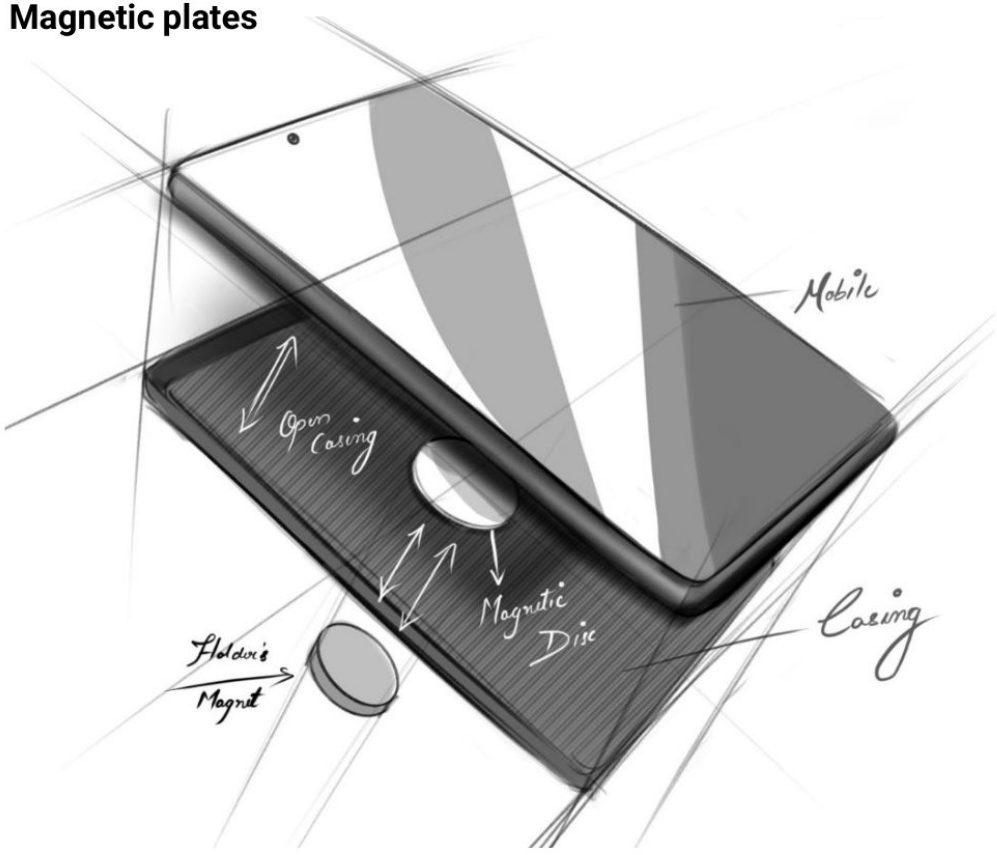


Fig 146 . Mock up detailing

Magnetic plates



Magnetic attachments are easily possible for mobile phones having magnetic charging feature like iPhone. For phones without this feature a magnetic disk can be placed inside the phone case and this case can easily stick to a magnetic holder along with the phone. The magnet is powerful enough to hold the mobile in position and also maintain the orientation in which they are placed.

Fig 147. Magnetic disc mechanism

Room Dimensions

In order to find out the suitability of the product the dimensions of kitchens and sketching rooms of 20 users were collected

Sl No:	Kitchen Type	Dimensions[in m]
1	Single walled	3.1 x 2.6 m
2	Single walled	2.9 x 2.5 m
3	Single walled	3.2 X 2.6 m
4	Single walled	3 X 2 m
5	Single walled	3.3 X 2.8 m
6	Single walled	3 x 2.2 m
7	Single walled	3.2 x 2.3 m
8	L shaped	3 x 3.6 m
9	L shaped	2.9 x 2.8 m
10	L shaped	3.3 x 2.9 m
11	L shaped	3 x 2.1 m
12	L shaped	2.9 x 2.9 m
13	L shaped	3 x 2.7 m
14	L shaped	3 x 3 m
15	Gallery kitchen	3.2 x 2.8 m
16	U shaped	3.2 x 3 m
17	U shaped	3.4 x 3.1 m
18	U shaped	3.1 x 2.9 m
19	Island kitchen	3.6 x 3.1 m
20	Island kitchen	3.5 x 3 m

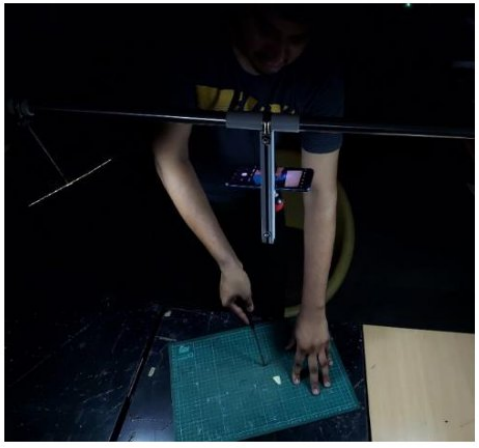
Sl No:	Dimensions [in m]
1	3 x 2.9 m
2	3.2 x 3 m
3	2.2 x 2
4	2.8 x 3.2 m
5	2 x 2.6 m
6	3.1 x 2.5 m
7	2.9 x 2.6 m
8	3.1 x 3 m
9	3 x 2.6 m
10	3.2 x 2.8 m
11	3 x 2.6 m
12	3 x 3.8 m
13	2.8 x 3.1 m
14	3.1 x 2.8
15	3 x 2.9
16	3.6 x 2.8 m
17	3 x 2.9 m
18	3.1 x 2.7 m
19	3.2 x 2.7 m
20	3 x 2.9 m

Based on the data , it was found that some kitchens were large and coming close to 3.6 m in length. Some of the users used bedrooms itself for sketching and art works which was also coming close to lengths of 3.6m length.

10.1 Mock Up Testing

Fig 148 . Mock up testing

The mock up was tested to verify its workability and find out any difficulties



Insights

The design was flexible and the mobile and lightings could be moved over the rod very conveniently according to the requirements of the user. User could record from top view very effectively

The design could also be shifted to a different orientation making it suitable for kitchens of various layouts.

However this design had some **limitations.**

Dimensional constraints – The design is very much suitable for kitchens and rooms having small dimensions but wont be suitable for larger rooms as the pipe length may fall short and may not reach both the ends, making the product dysfunctional.

Packaging difficulties – The long length of the pipes would make it difficult for packaging and transportation

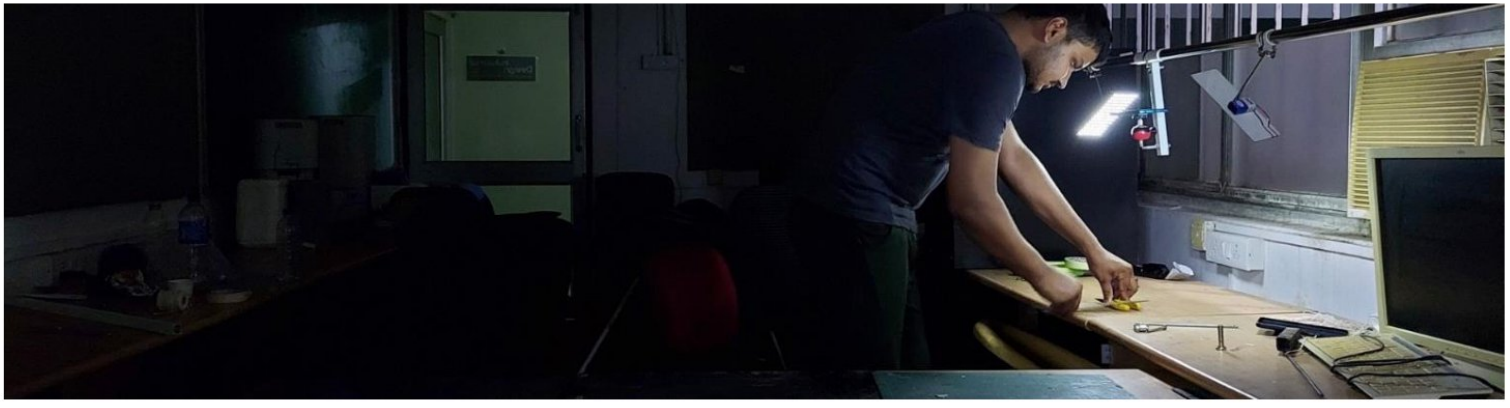


Fig 149 . Mock up insights

Eventually this design had to be **discarded** due to these factors.

11. Final Concept

Recording on a string

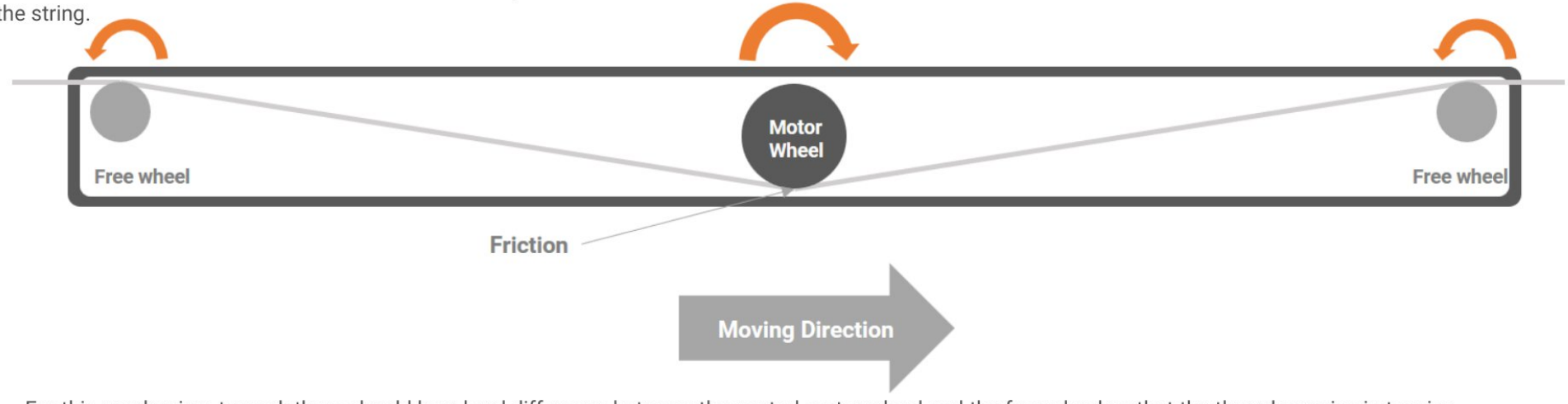
In this concept camera is made to run on string using a 3 wheel mechanism. The center wheel is attached to the motor and the 2 others are freely rotating type. In this way the camera can be made to move in the forward and backward directions This design is inspired from the big professional camera set up used in filming high velocity actions scenes. Thus a customized compact version can be made for mobile phones.

Fig 150 . Cable cam

Fig 152 . Cable cam size comparison

Working Mechanism

The device moves forward due to the friction created by the string.



For this mechanism to work there should be a level difference between the central motor wheel and the free wheel so that the thread remains in tension

Different ideations were tried keeping intact the wheel alignment

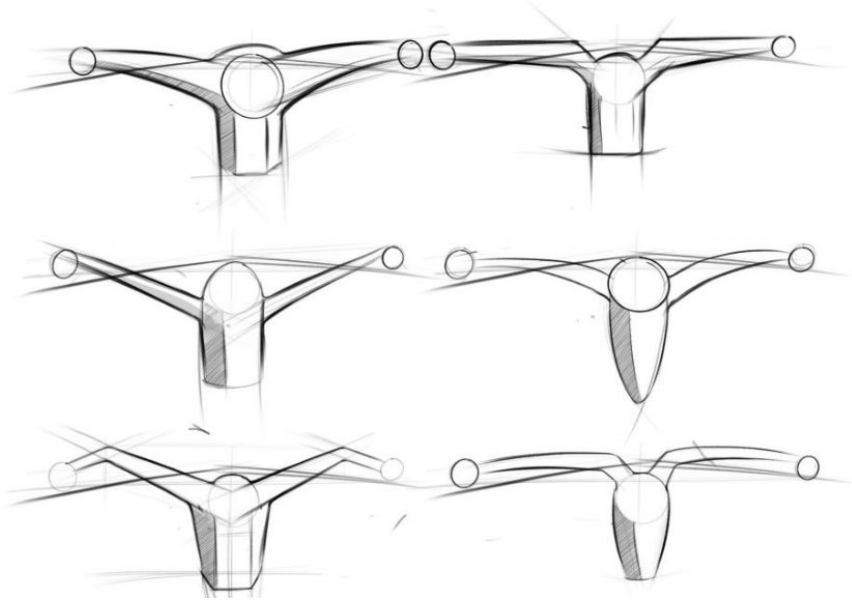


Fig 153 . Wire cam ideations

11.1 Concept 1

Groove Cut Design

In this concept an an angle groove is given for the threat to be put into it so that the thread gets aligned by itself thus decreasing the number of steps for user and making it more convenient.

The thread can be aligned in any manner by using hooks so that it covers the whole room

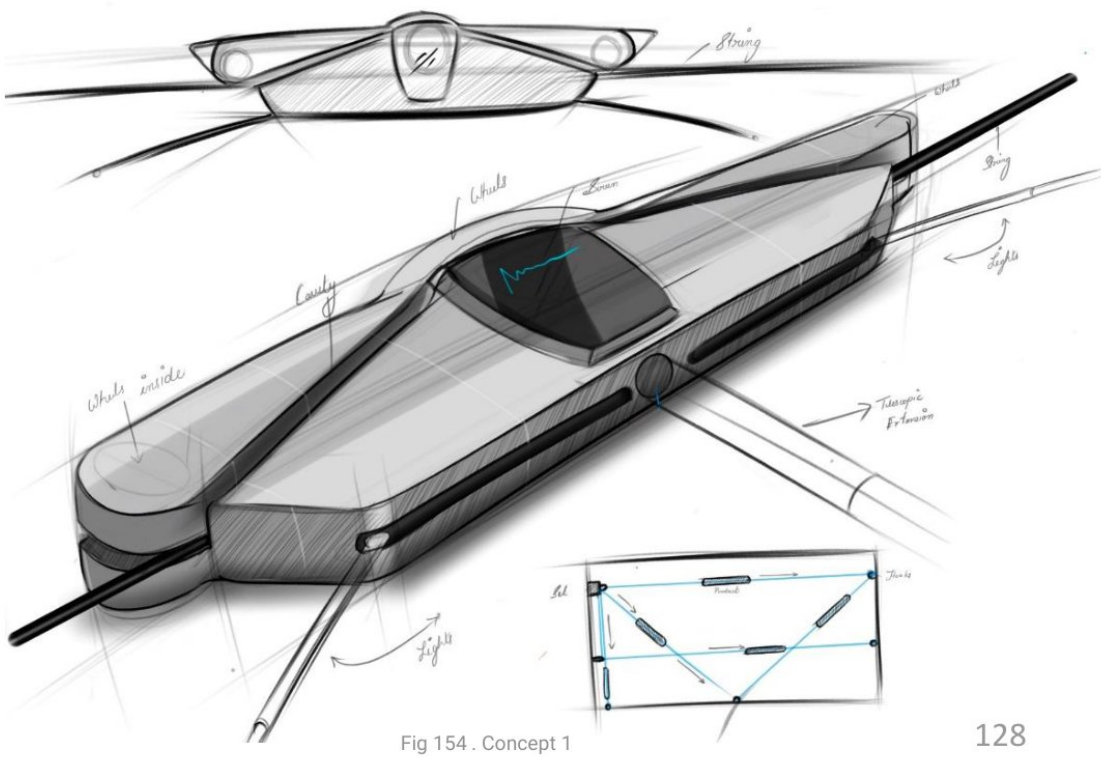


Fig 154 . Concept 1

11.2 Concept 2

Straight grooved Push-up Design

This is a modification of the earlier concept. Here the groove is straight instead of an tilted one. The user has to simply slide in the thread into the into the groove minimising the number of steps and making it easier and comfortable for the user. The user now has to push up the central wheel so that it comes in an alignment to bring about the friction.

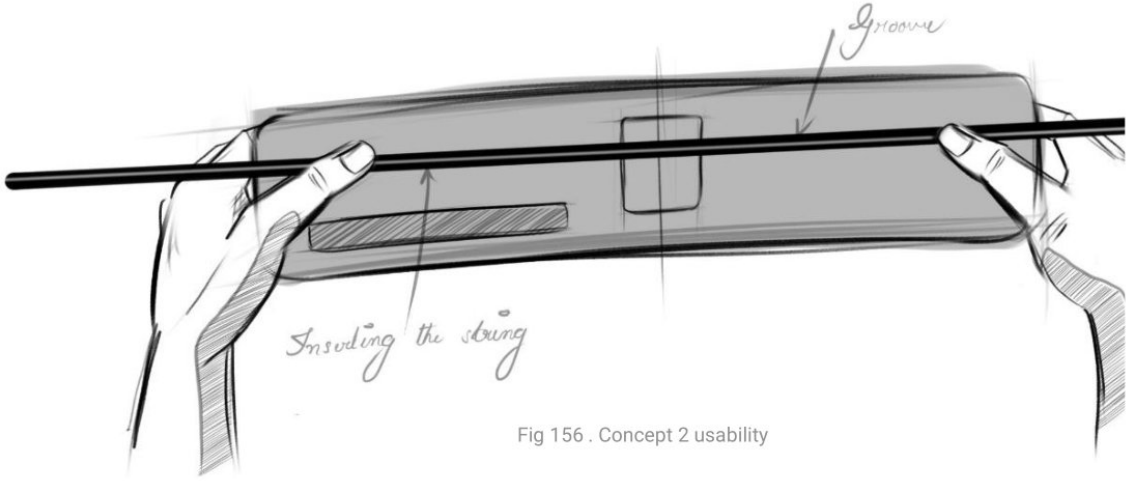


Fig 156 . Concept 2 usability

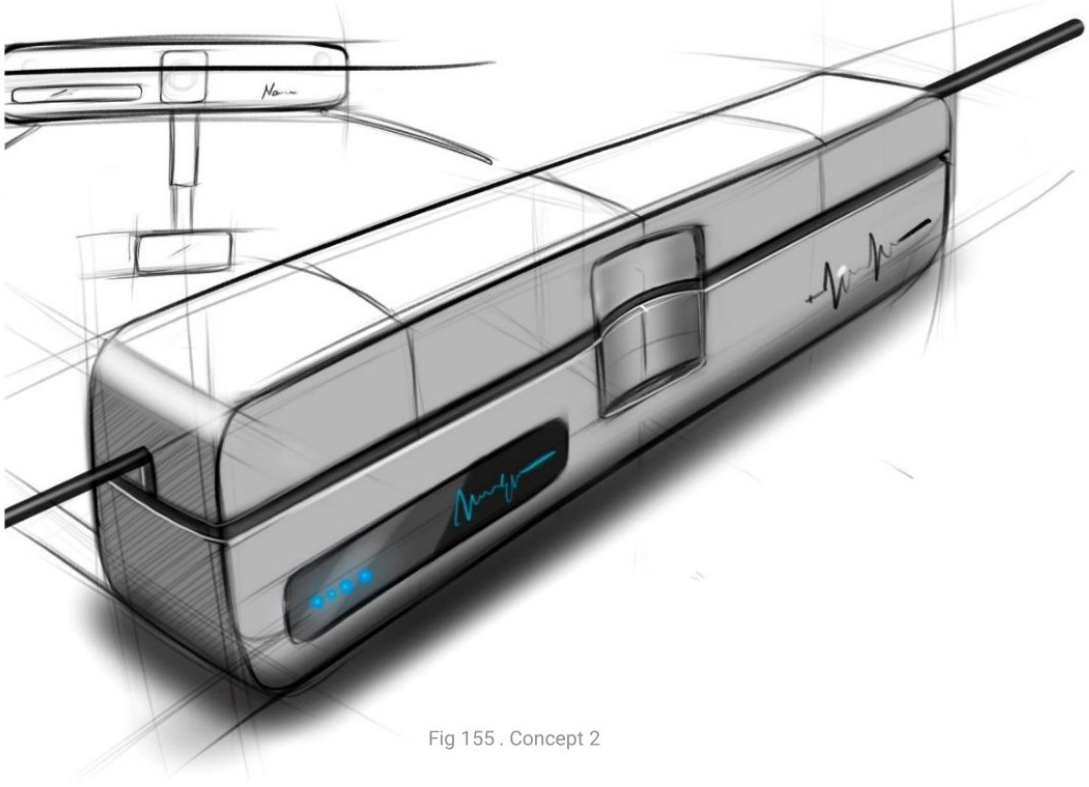


Fig 155 . Concept 2

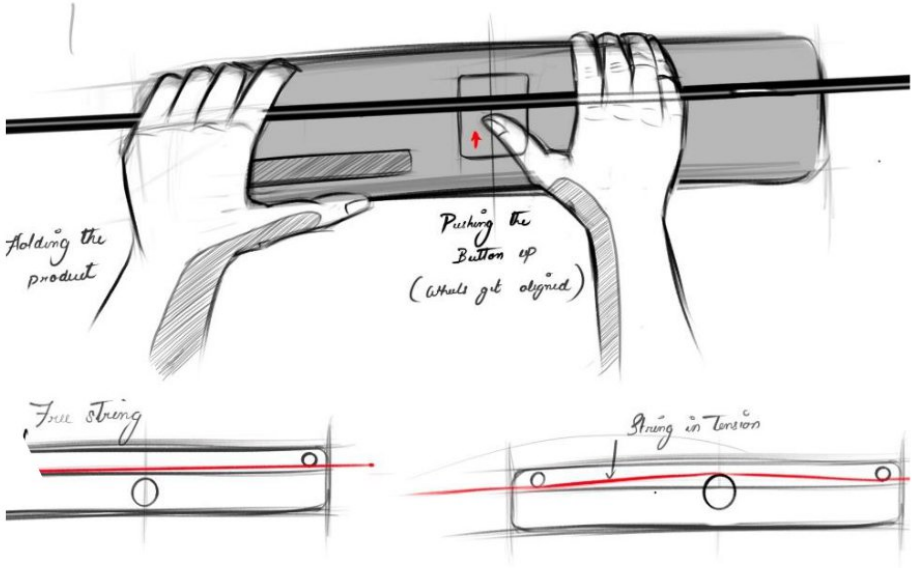


Fig 157 . Concept 2 steps

11.3 Concept 3

Straight grooved Push-down Design

This is an attempt to modify the earlier concept and reduce the number of steps so that it becomes further easy for the user .

This design reduces one more step in the earlier design.
Now the user can simply push down the freewheel soon after the device is slid in the thread. The user doesn't have to change his grip to do this step

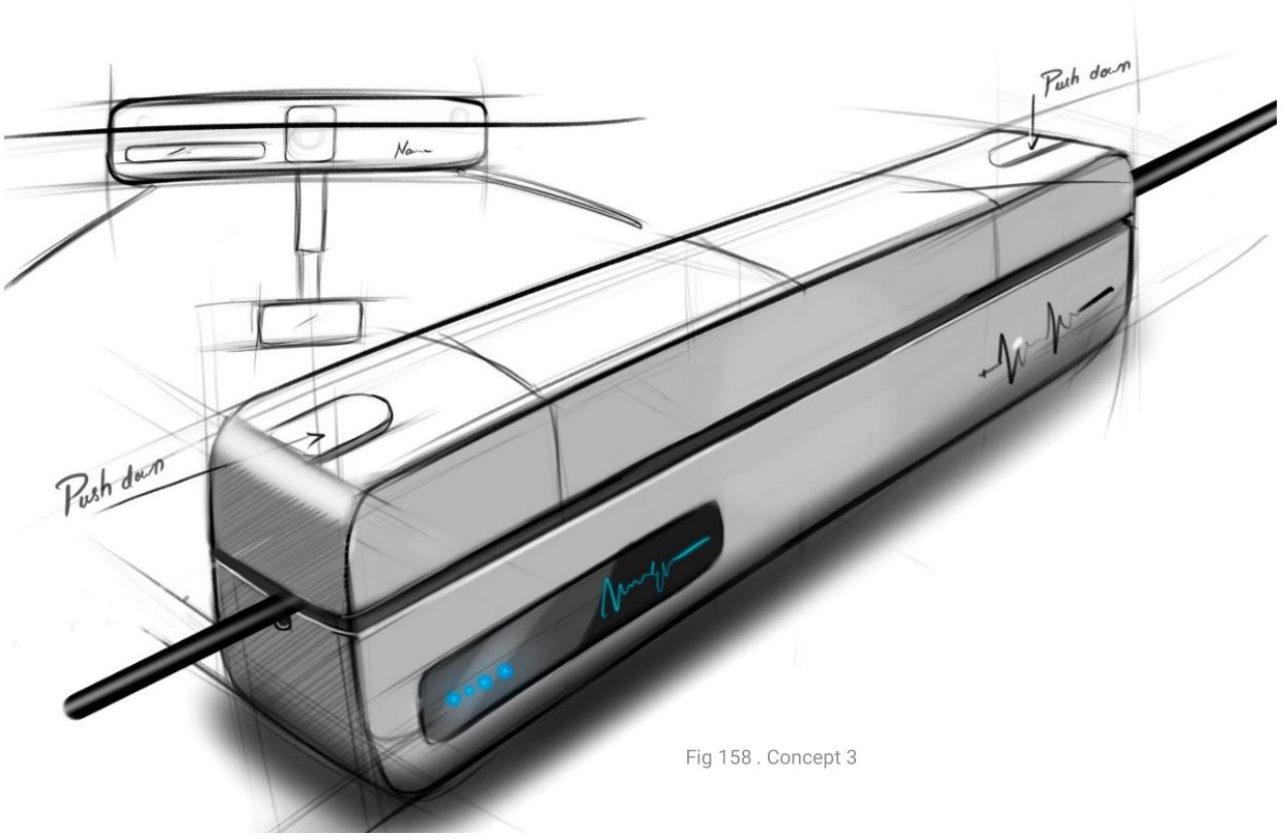


Fig 158 . Concept 3

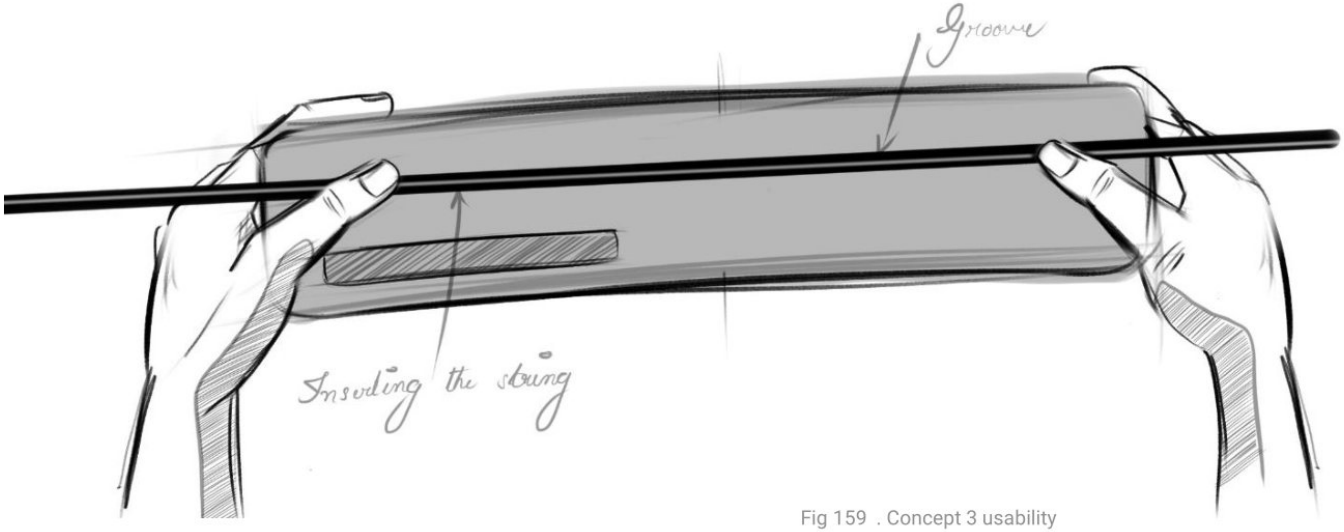


Fig 159 . Concept 3 usability

11.4 Concept 4

Minimal Aluminum Tube Design

This concept is a very minimalistic approach to the 3 wheel mechanism design. Here the whole assembly is concealed in an aluminium tube and the design is very simple. The user doesn't have to slide in the device to make a proper alignment. All the mechanisms are already in built and the user doesn't have to worry about it anymore. The aluminium tubes gives the design very sleek look making it more minimal.

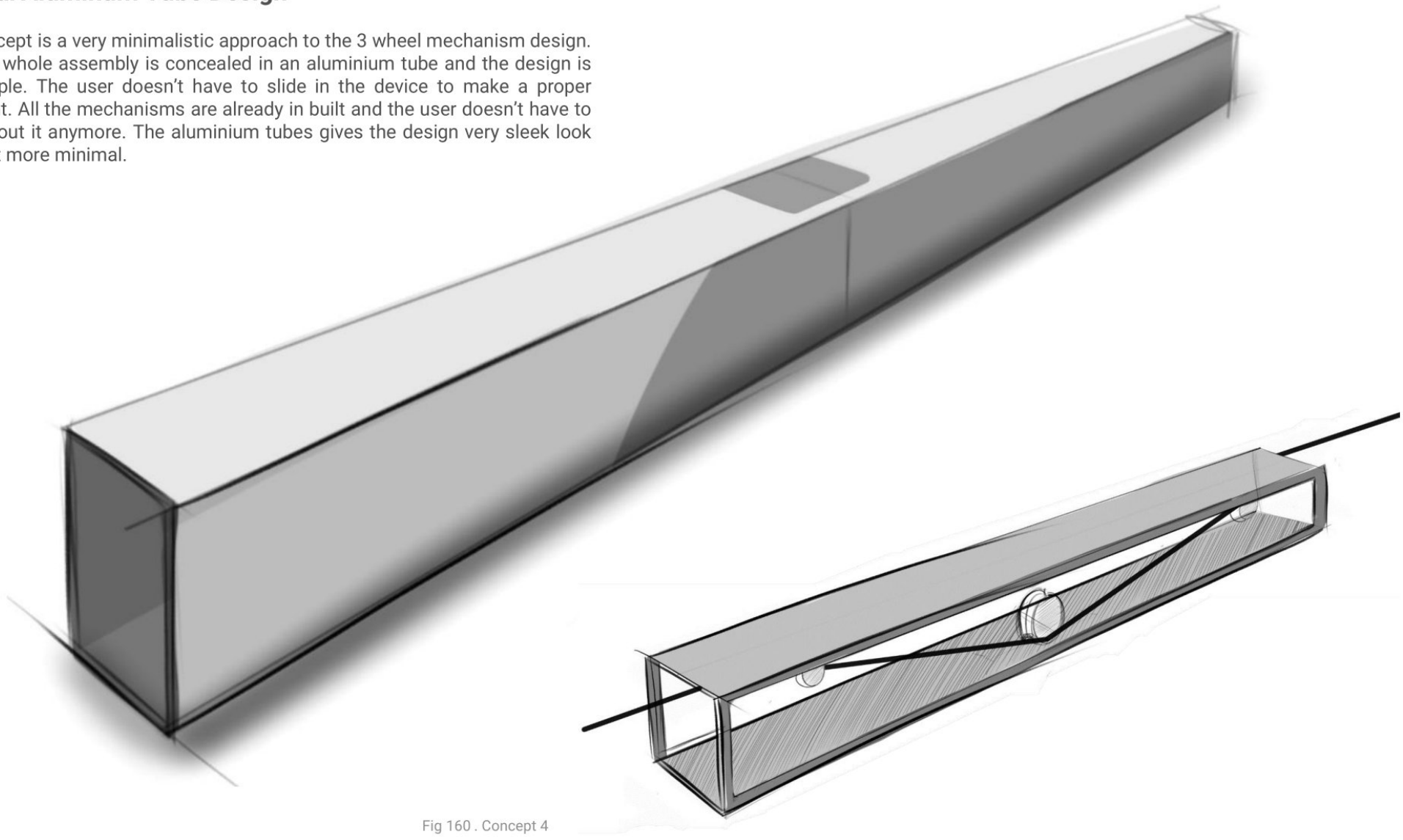


Fig 160 . Concept 4

12. Mock up – Minimal Al Tube Design

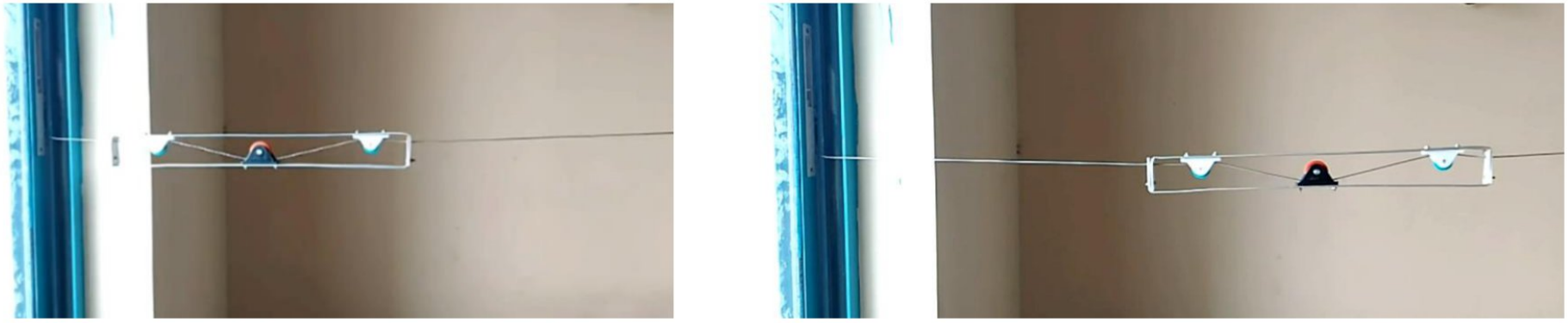


Fig 161 . Mock up testing

A mock-up was made to test the 3 wheel mechanism and it was working perfectly fine . It could move smoothly on a string.

12.1 End Capping

The aluminium tube will have plastic enclosures which would have the USB charging port, power button etc.

The recoiling mechanism is designed such that it can be detached along with the product and can be stored separately.

The wall attachment would be screwed and it will have a simple slide in mechanism.

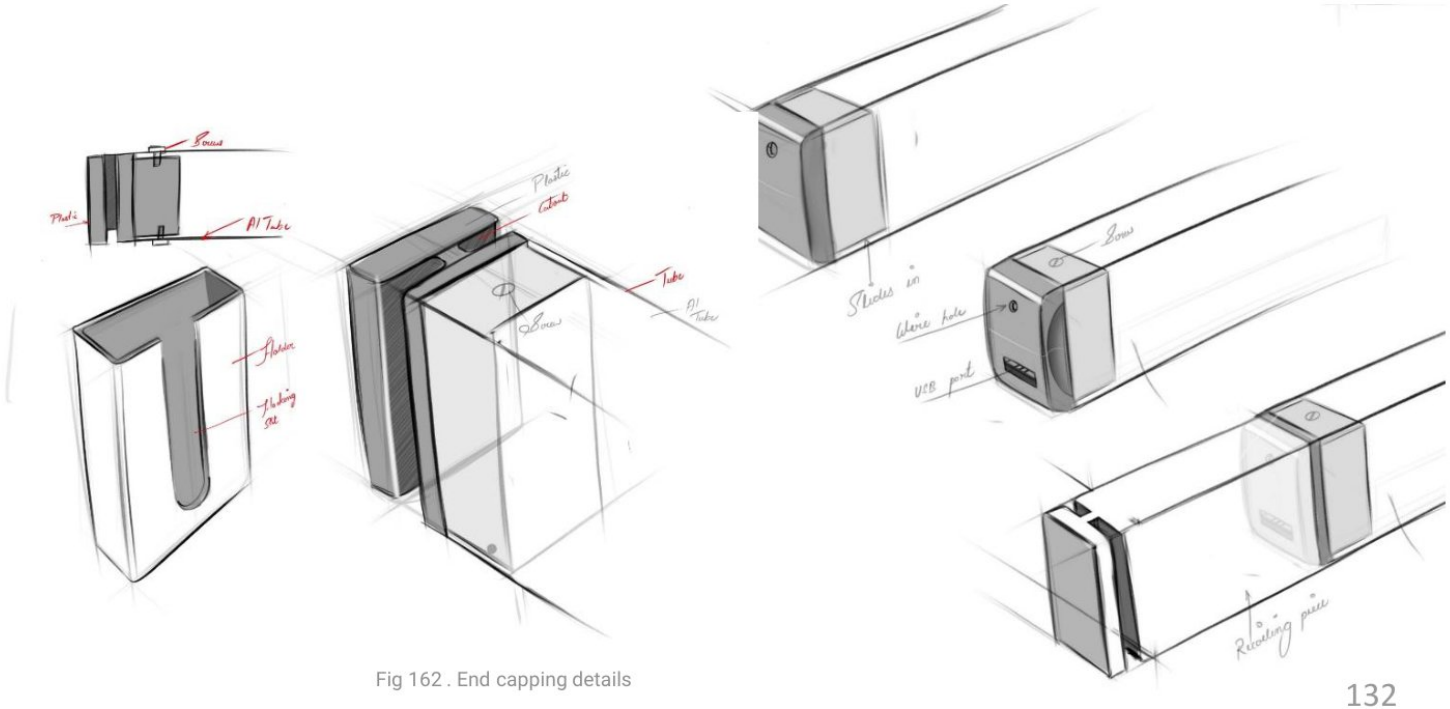


Fig 162 . End capping details

A number of enclosure designs with 3D printed and tested out to choose the most suitable one. The wall attachment detail and recoiling mechanism interlocking unit were also 3D printed and checked to verify it worked well .

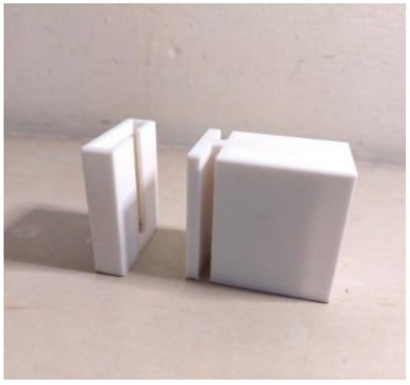


Fig 163 . Product mock ups

12.2 Interlocking Mechanism

Fig 164 . Interlocking

The product has a very minimal interlocking mechanism on the wall. The user simply has to slide in the recoiling part to the wall attachment part. The device then becomes freely slidable on the string. It has the same interlocking mechanism only opposite wall as well.

Insight

Upon testing the mock up it was found that the recoiling force alone will not be able to withstand the weight coming on the string once all the attachments are made. So in addition there is a tightening mechanism using an Allen key setup which is embedded within the design itself.

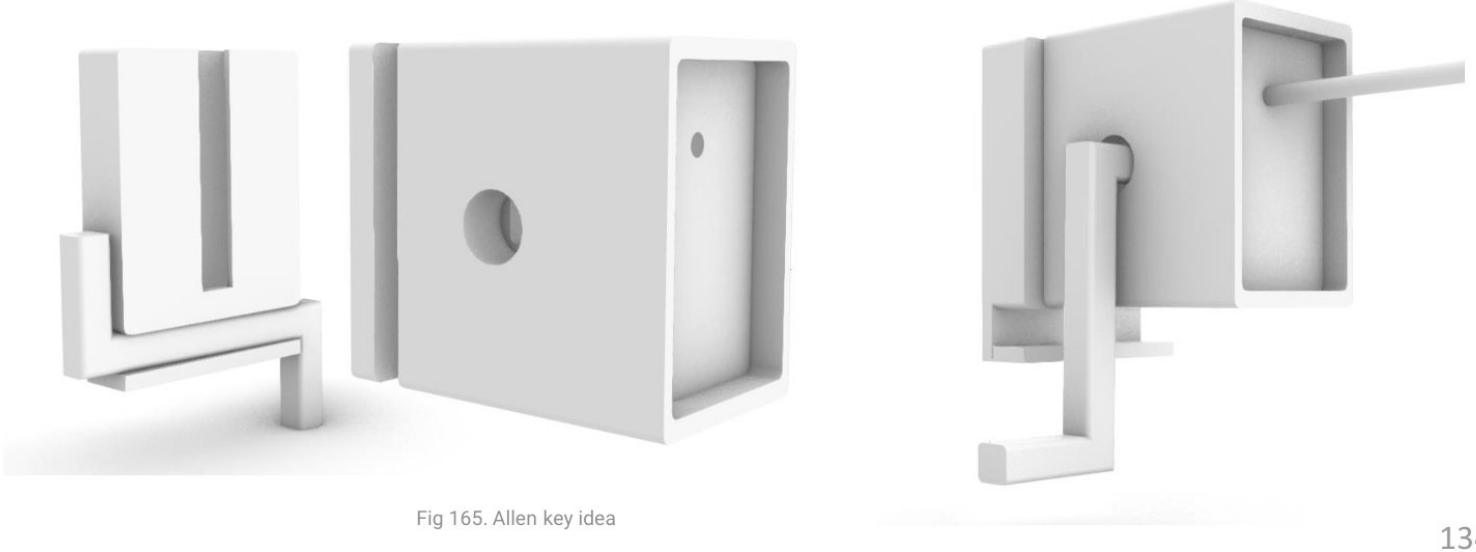


Fig 165. Allen key idea

12.3 Mobile Holder Design

The most important factor while designing the mobile holder was the **center of gravity** of the system . It goes at most necessary that all the weight should be coming exactly below the moving part to maintain the correct orientation of the device. The other factors to be considered were -

- Mobile Holder attachment to the moving part
- Phone and holder interaction
- Facilitate all orientations of mobile (Portrait , Landscape , tilted angles)
- Communicating with the user about way of attachment

After some ideations it was found that at C shaped holder with an embedded magnet could be suitable for this function . It was important than all the orientations of the mobile phone should be taking place exactly below the moving part so that the centre of gravity of the system is maintained and the device is stable.

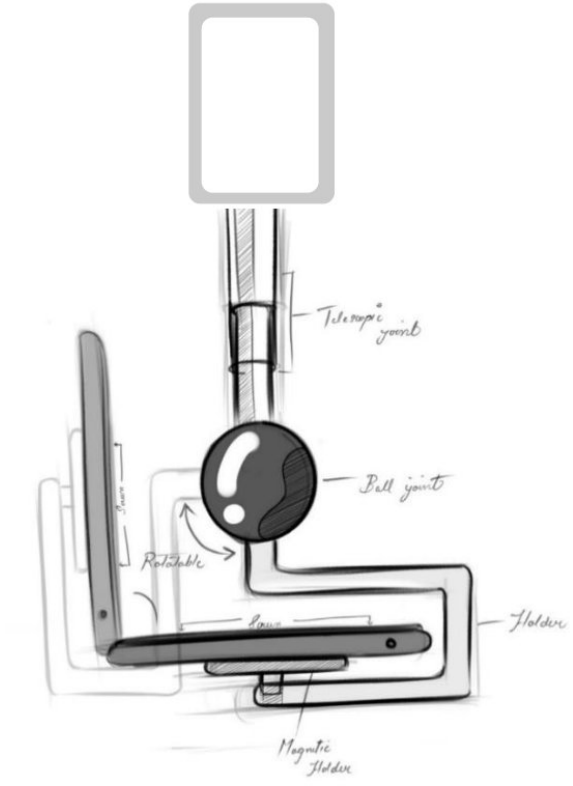


Fig 166 . Mobile holder

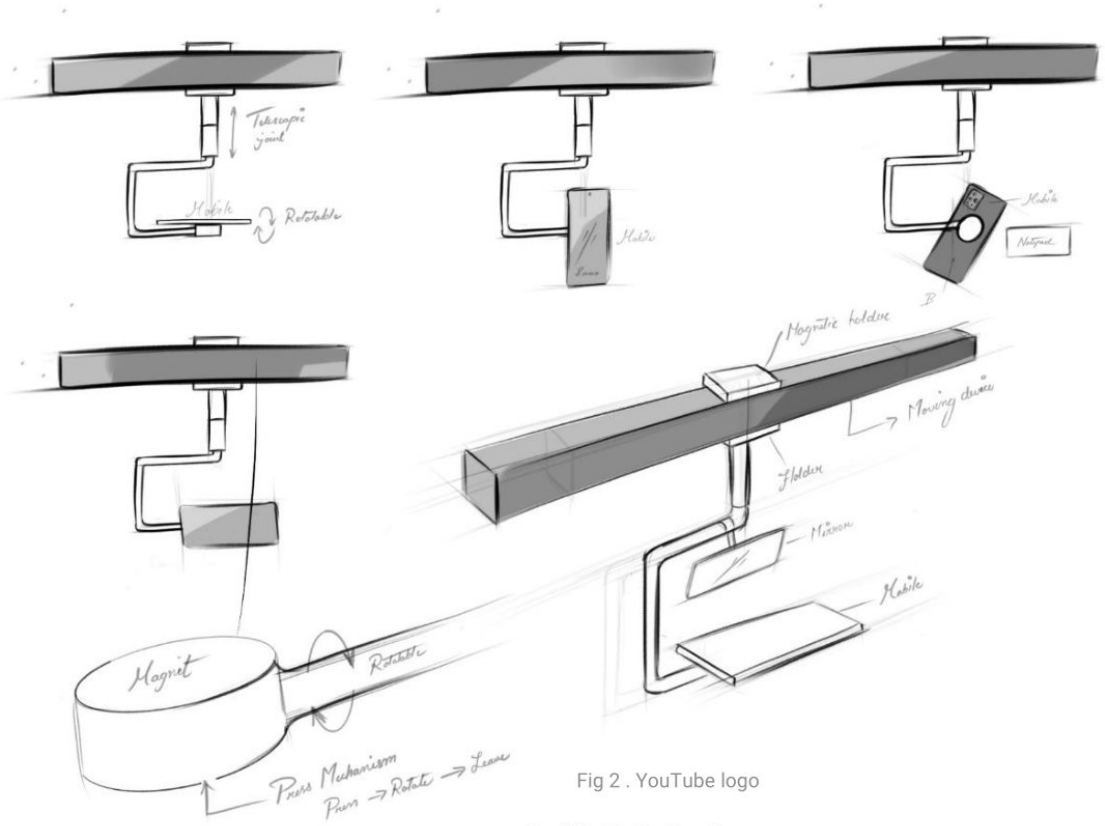


Fig 2 . YouTube logo

Fig 167 . Holder iterations

12.4 Circular cutout Detail

This cut-out detail was given at the back so that the user can easily find the way of attachment of the device . It will also have a tiny magnetic connector to hold the clamp as well as give electric supply to the detachable part

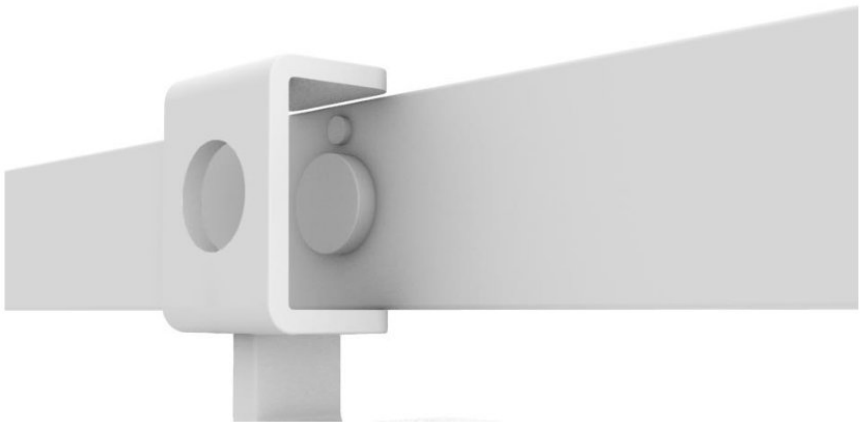


Fig 168 . Circular cut out

Different iterations of holder design were tried it out to find the most aesthetic one.

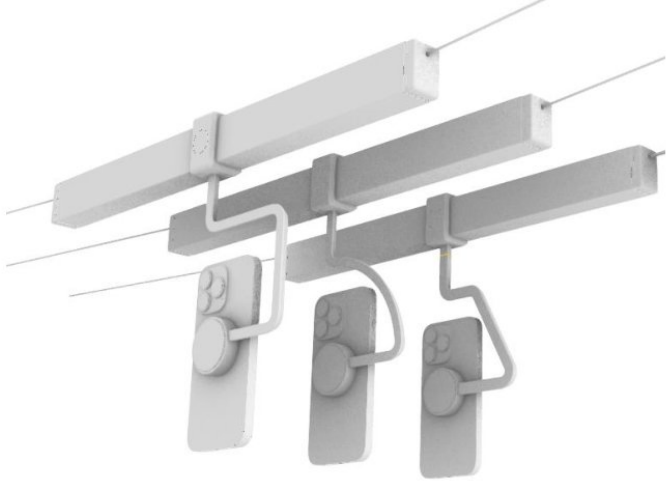
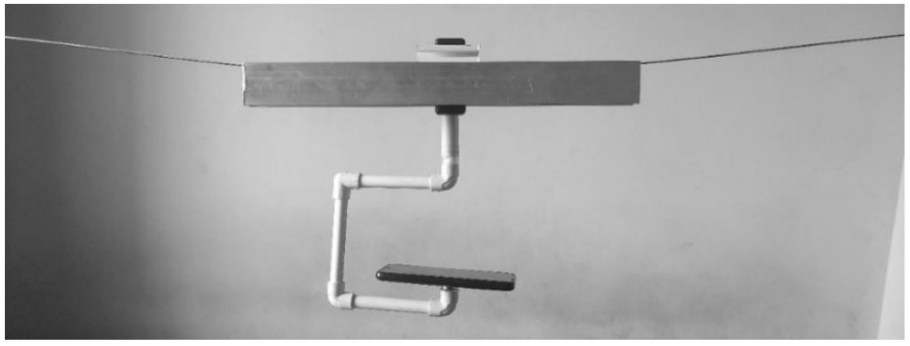
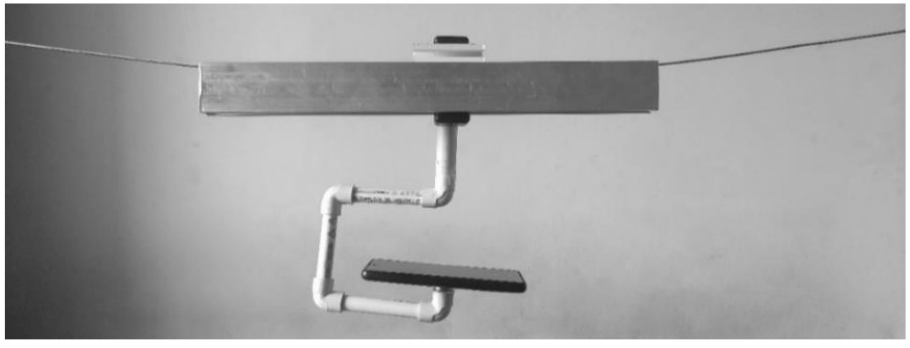


Fig 169 . Mobile holder ideations

12.5 Holder Mock ups

Mock-ups were also made to test the aesthetics of the design and the last design was selected





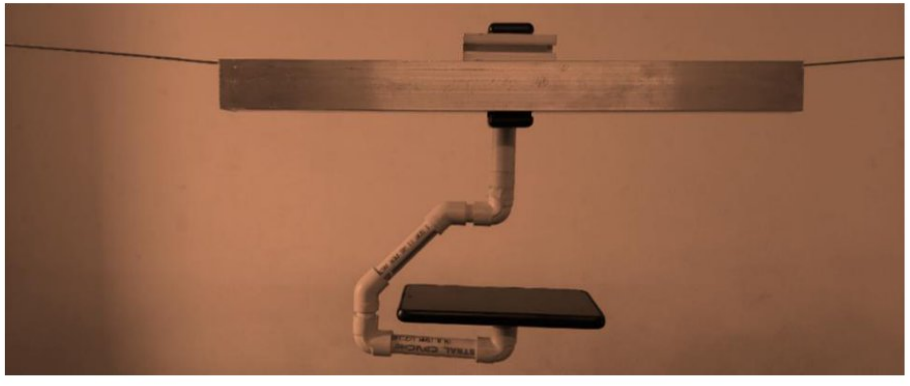


Fig 170. Holder mock ups

12.6 Aluminum Tubes

For deciding the dimensions of the moving part , aluminium tubes of different dimensions were tested by attaching with the mock-ups and the most aesthetic one was chosen.

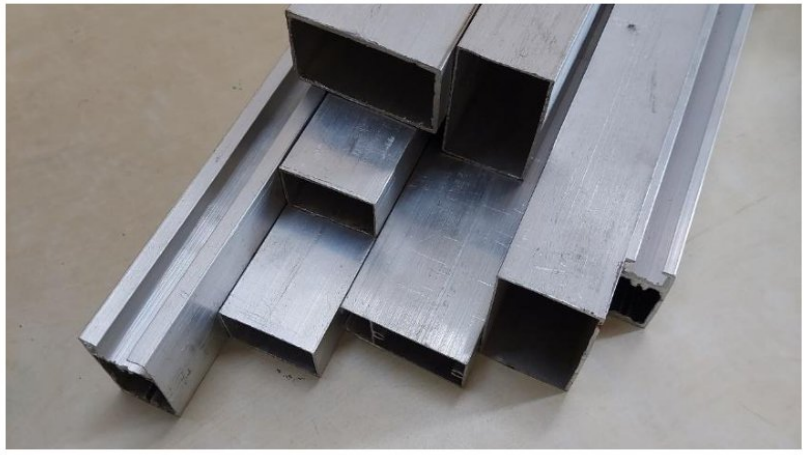


Fig 171 . Al tubes

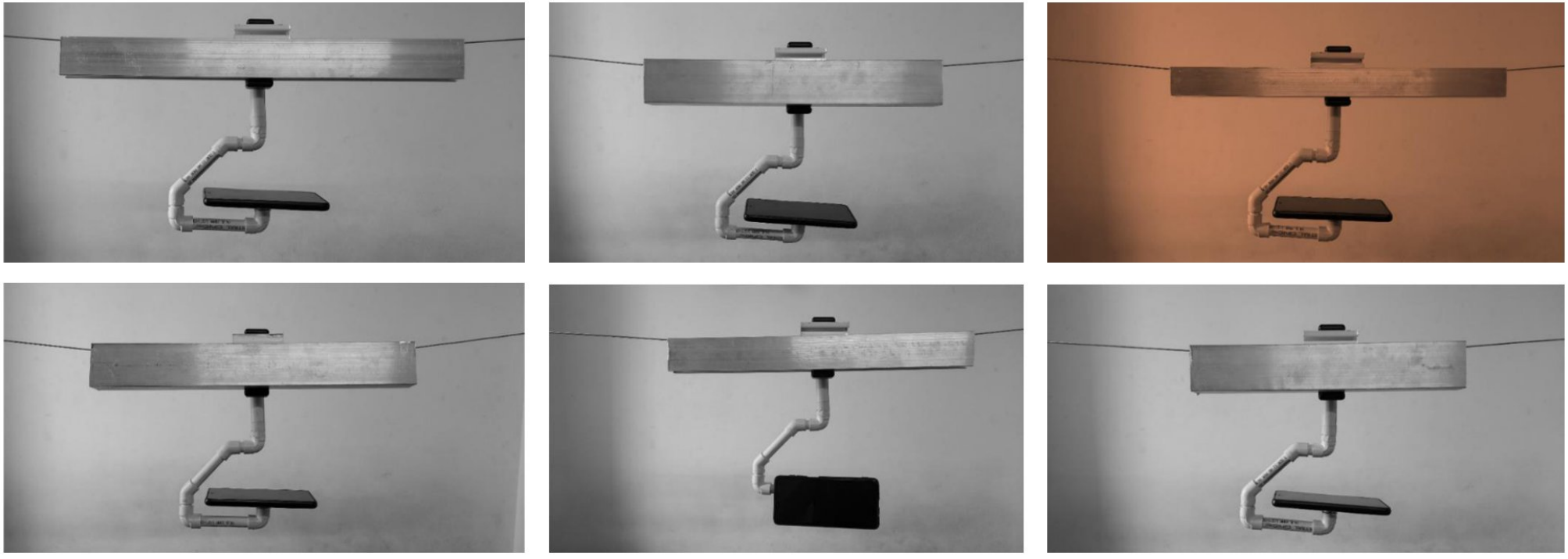


Fig 172 . Al tubes dimensions

Here the 3rd one having a length of 45 centimetre was chosen for the final product

12.7 Magnetic Attachment

Magnets were used to attach the mobile phones onto the device .A small magnetic disk was kept inside the case and mobile attached to the device. The magnets holds the mobile steady and also maintains the orientation in which it is kept. A magnet having a diameter of 4- 5 cm would be a best option.

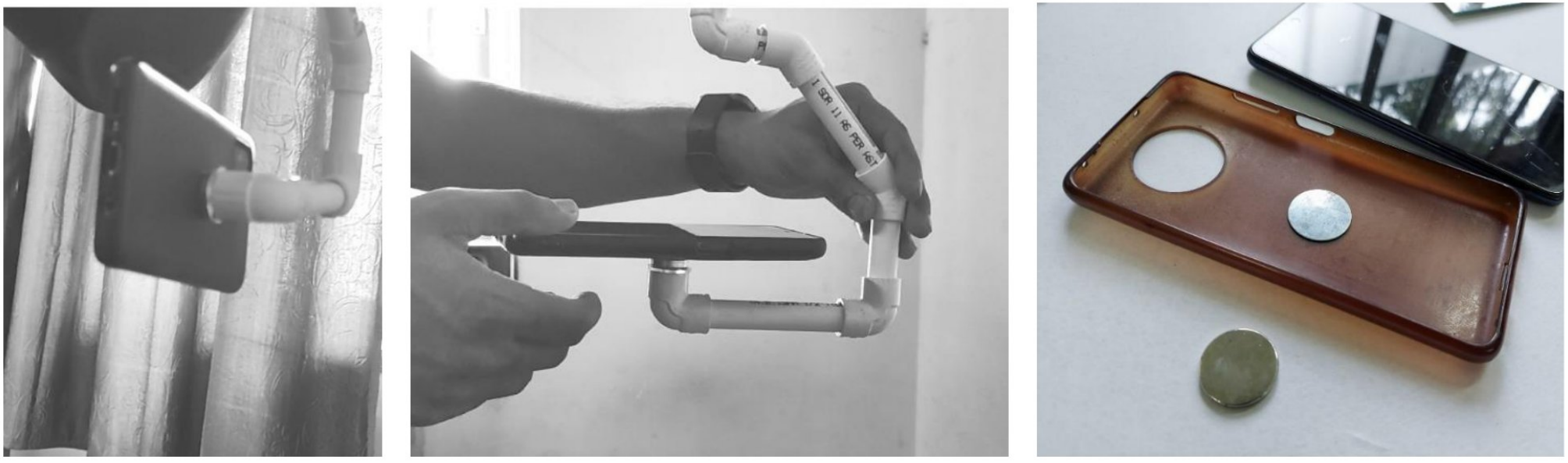


Fig 173 . Magnetic connection

12.8 Different orientations using magnetic attachment

The figures show the different varieties of orientation setups possible using this holder design and using magnetic holders. The holder is designed in such a way that, in whichever form it gets aligned , the center of gravity is maintained and the mobile rotations happen exactly at the bottom of the moving part and doesn't alter the stability of the device.

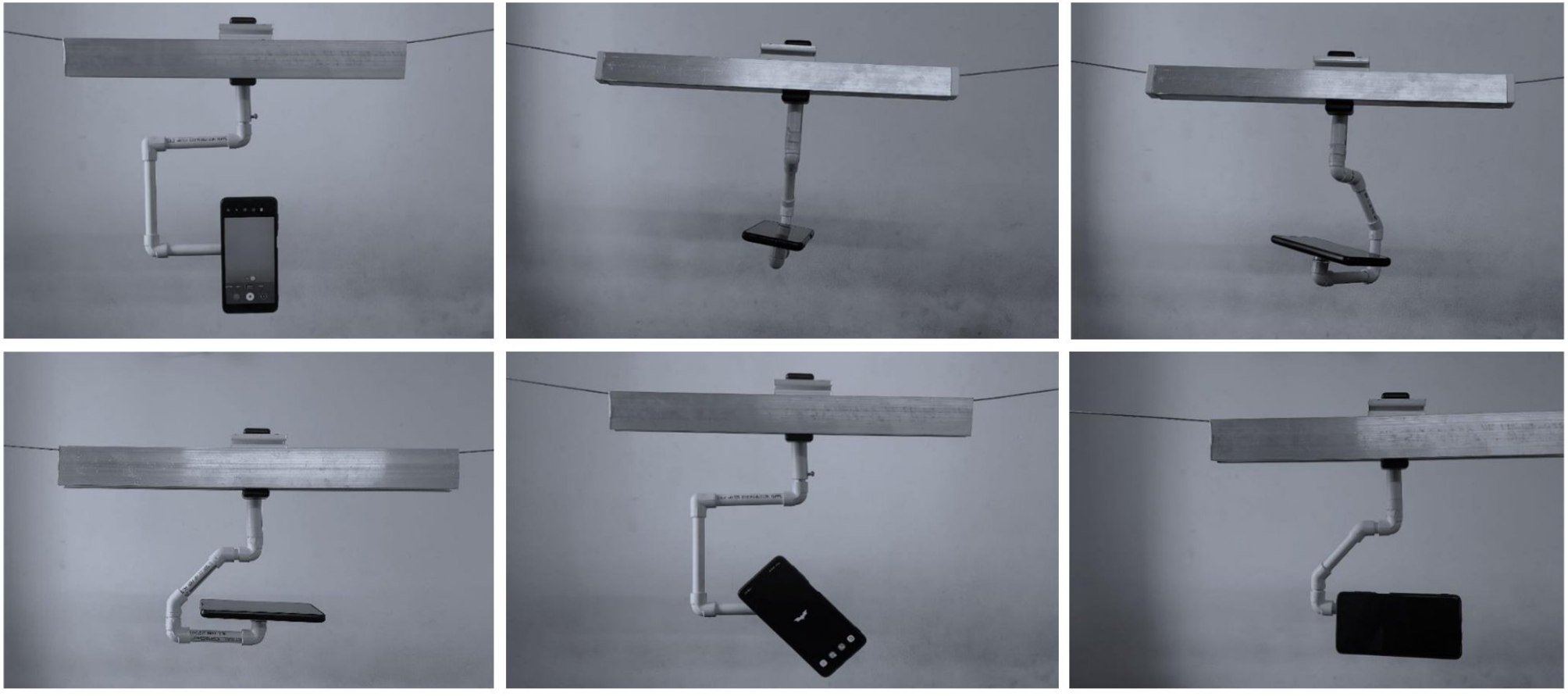


Fig 174 . Different mobile phone orientations

12.9 Cooking fumes interference

As mentioned earlier in the report when cooking videos are shoot from top view there is a chance at the cooking films can get accumulated on the camera lens resulting in a blurry video.

Fig 175 . Kitchen fumes

12.10 Mock up – Fumes Testing

This was tested using joss sticks as a mock up

Fig 176 . Fumes mock up

Fig 177 . Blurry video

It was verified that the fume coming onto the camera lens results in a blurry video the video.

12.11 Testing Proposed Solutions – Blower concept

12.11.1 Using a USB fan

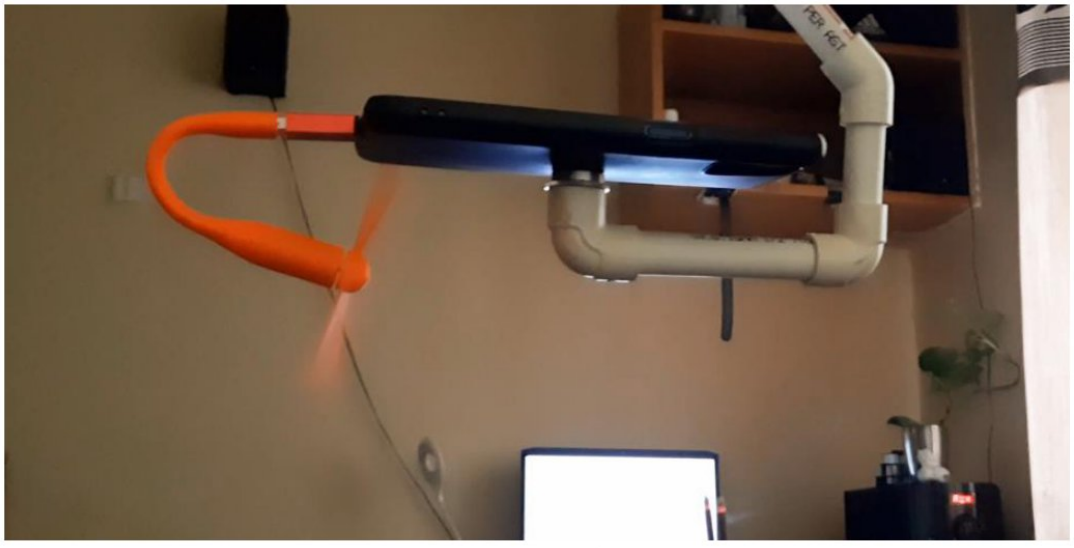


Fig 178 . USB fan

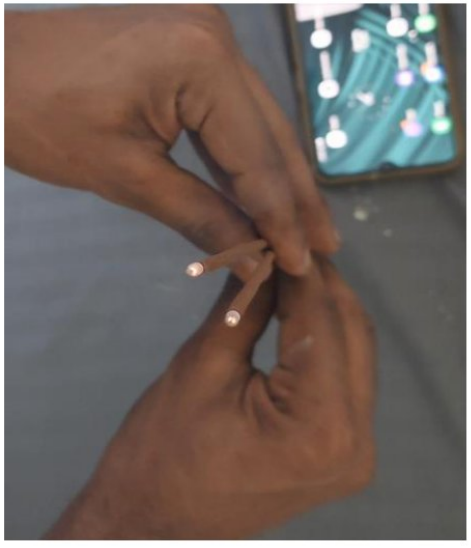


Fig 179 . Clear video

Insight

It was found that the fan was quite effective in keeping away the fumes from the camera lens and the resultant video was more clear. But it had a bit of of vibration.

12.11.2 Using a centrifugal laptop fan

Fig 180 . Centrifugal fan

Fig 181 . Centrifugal fan 2

Insight

Since the centrifugal fans blows air in a parallel direction to the mobile phone it was more effective compared to the USB fan.

It showed no vibrations and was also combatively silent, making these type of fans more suitable for the design

12.12 Testing Proposed Solutions – Mirror concept

When the device is above the users eye level he or she may not be able to see the area being covered in the video To tackle this situation a mirror can be used which lies above the mobile phone and can give the user and idea about the things being recorded. It needs to be a adjustable according to the users view.

Fig 182 . Mirror Concept

12.13 Eye Movement Analysis

It was noted during the interview that the user often forgets the dialogues or speeches that he is supposed to say and it would be better if he has some reference or some notes while recording the video. So while providing such a notepad it shouldn't be very obvious that he or she is referring the notes while speaking. So an experiment was conducted to verify the areas where it would be possible to attach a notepad without making it obvious that the user is referring it. So one mobile was placed in the centre surrounded by sticky notes which were numbered from 1 to 13 and the user was asked to look at each of them in sequence and his reactions were recorded

Fig 183 . Eye movement analysis

12.14 Eye Movement Experiment

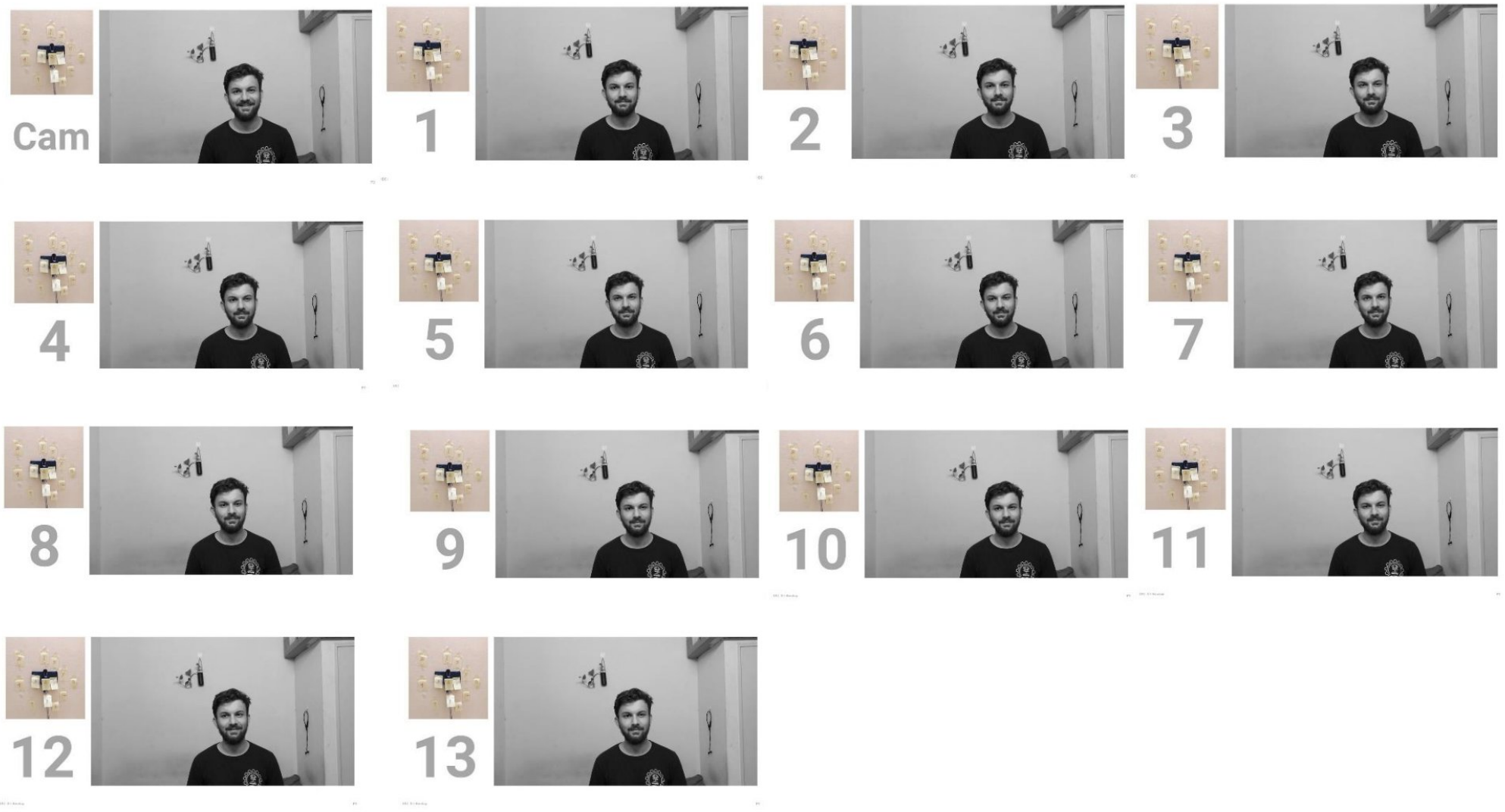


Fig 184 . Eye movement experiment

Insight

After the experiment it was found that the most suitable places for attaching the notepad were number 1, 2 and 5.

In these spots the user's eyes were not making it obvious that he's referring a notepad in front

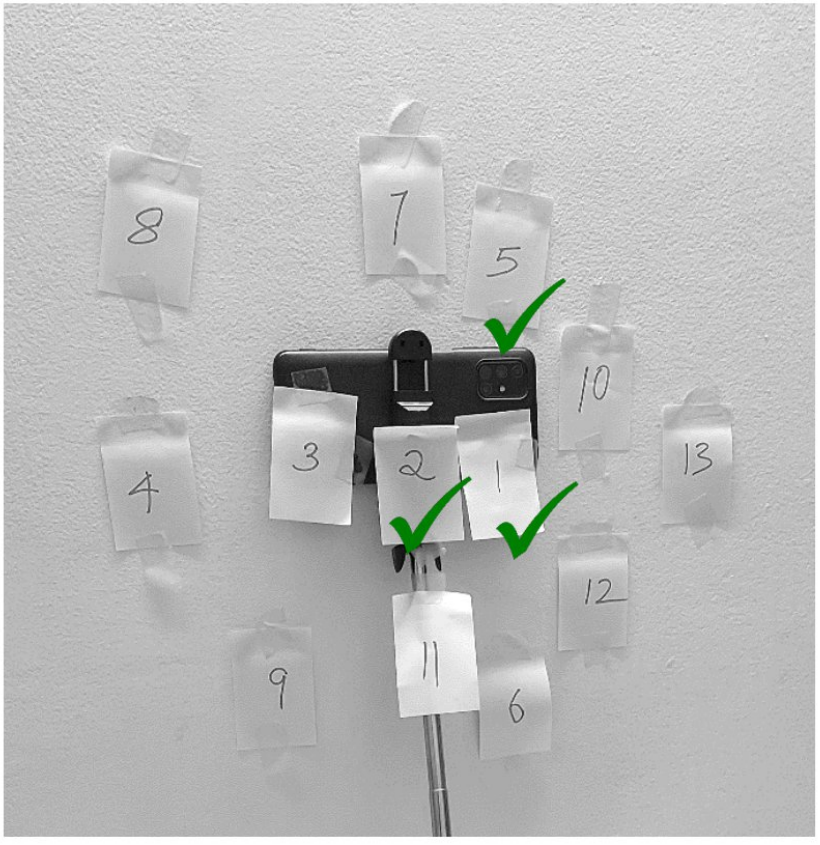


Fig 185 . Experiment set up

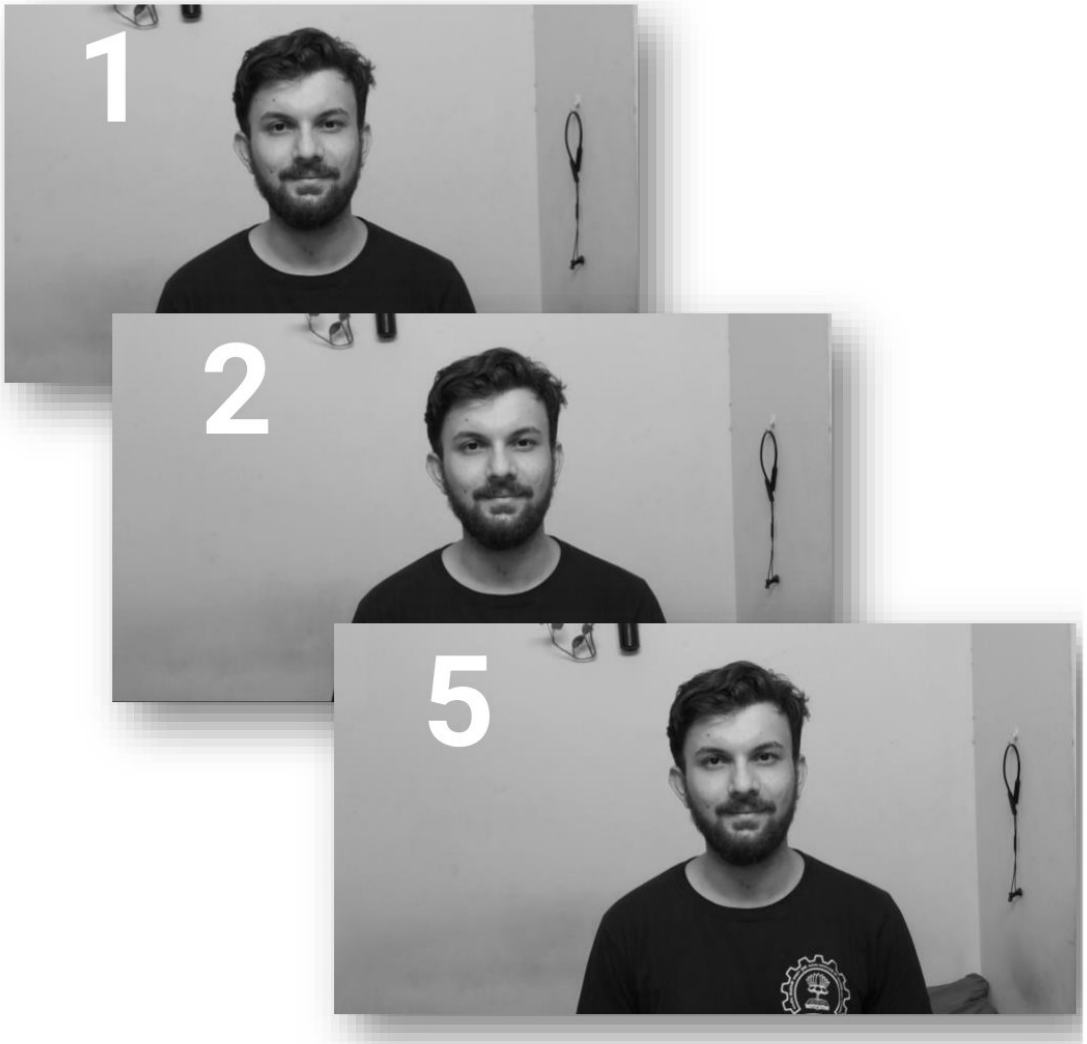


Fig 186 Possible views

12.15 3D Model

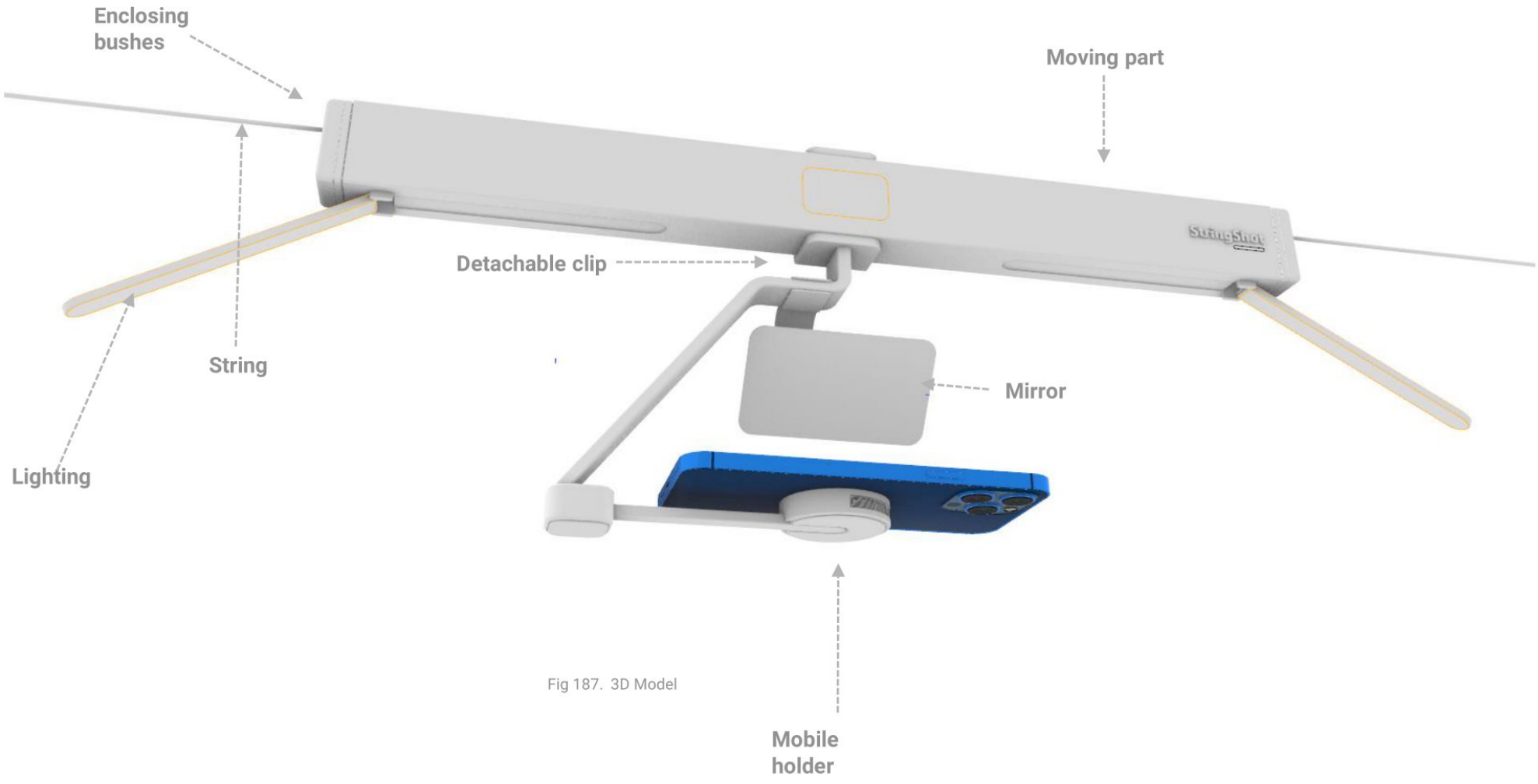


Fig 187. 3D Model

The design has a moving part which can respond to the users hand gestures. All the sensors, wheels and the connections are hidden inside the aluminium tube which is concealed from both sides using plastic enclosures. At bottom there are LEDS which can come down when required to illuminate the scene. The phone can get oriented in any direction right below the moving part keeping the centre of gravity of the system intact.

12.16 Mock up –

A mock up of the final product was made under to test the usability and it was tested by pulling it on a string.

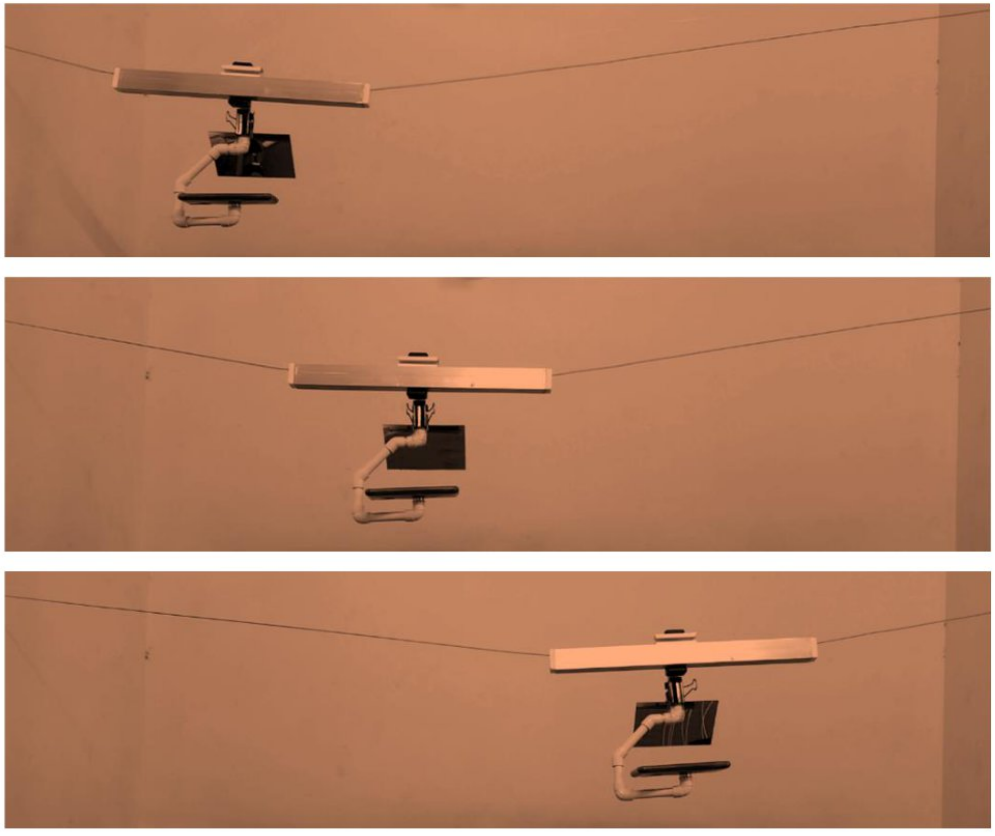


Fig 188 . Mock up testing

12.17 User interaction

The user can hover his hand in front of the device and the device can follow it using sensors.

Fig 189 .User Interaction

12.18 Charging detail

The final product will have a rechargeable battery and it will have a type C charging port located on one of the sides of the plastic enclosures.

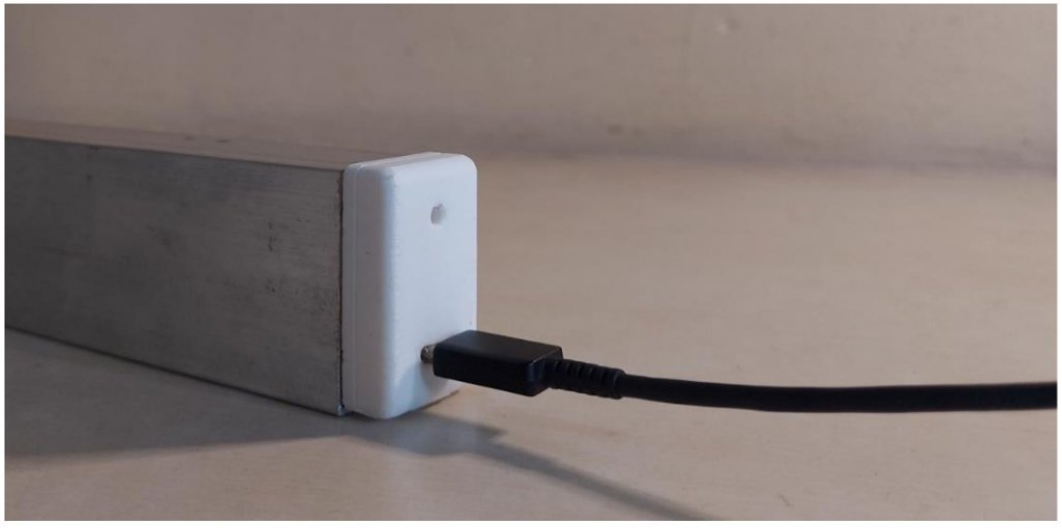


Fig 190 . Charging detail

13. Dimensional Details

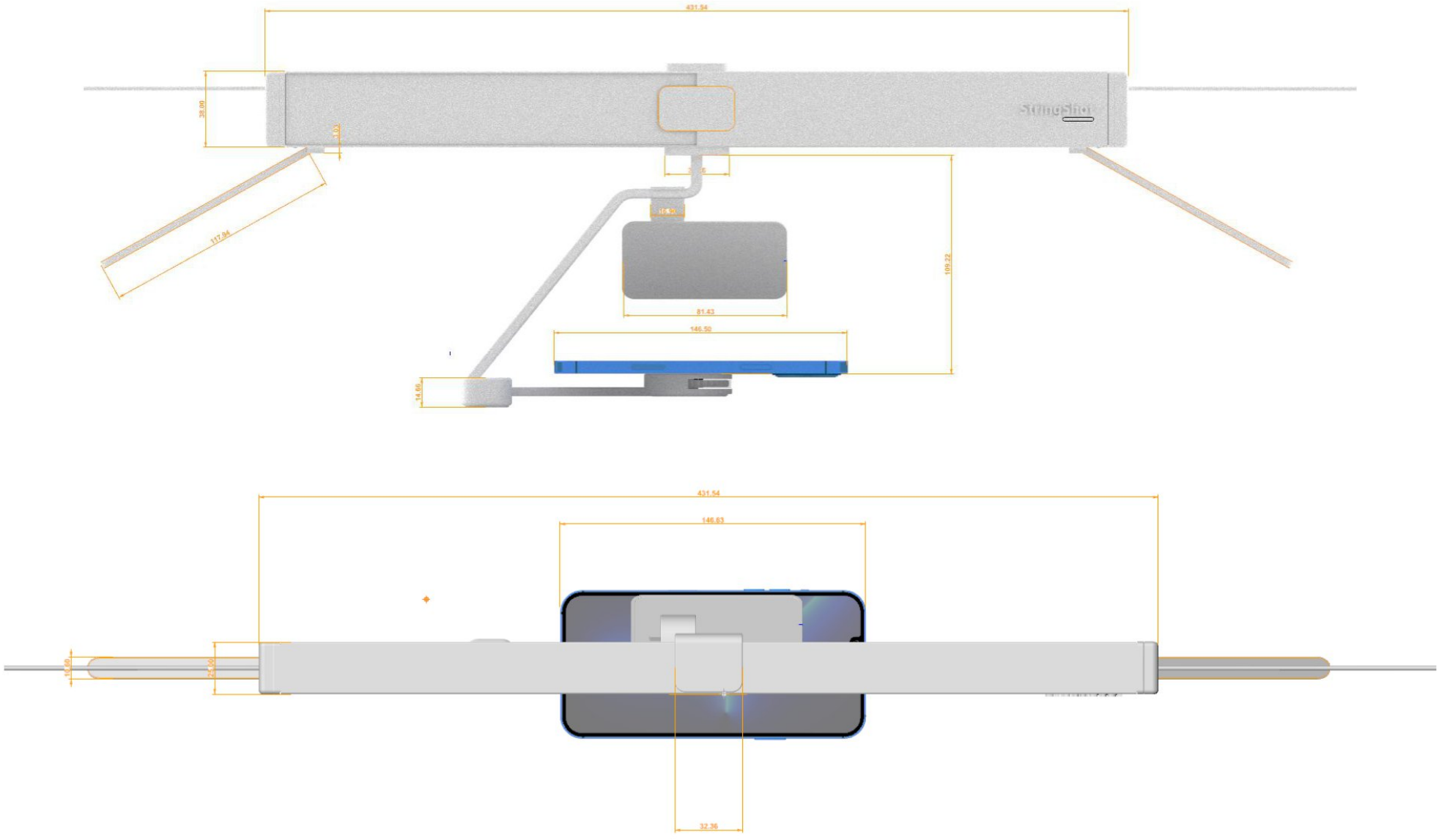


Fig 191 . Dimensional details

14. Renderings

Fig 192 . Render 1

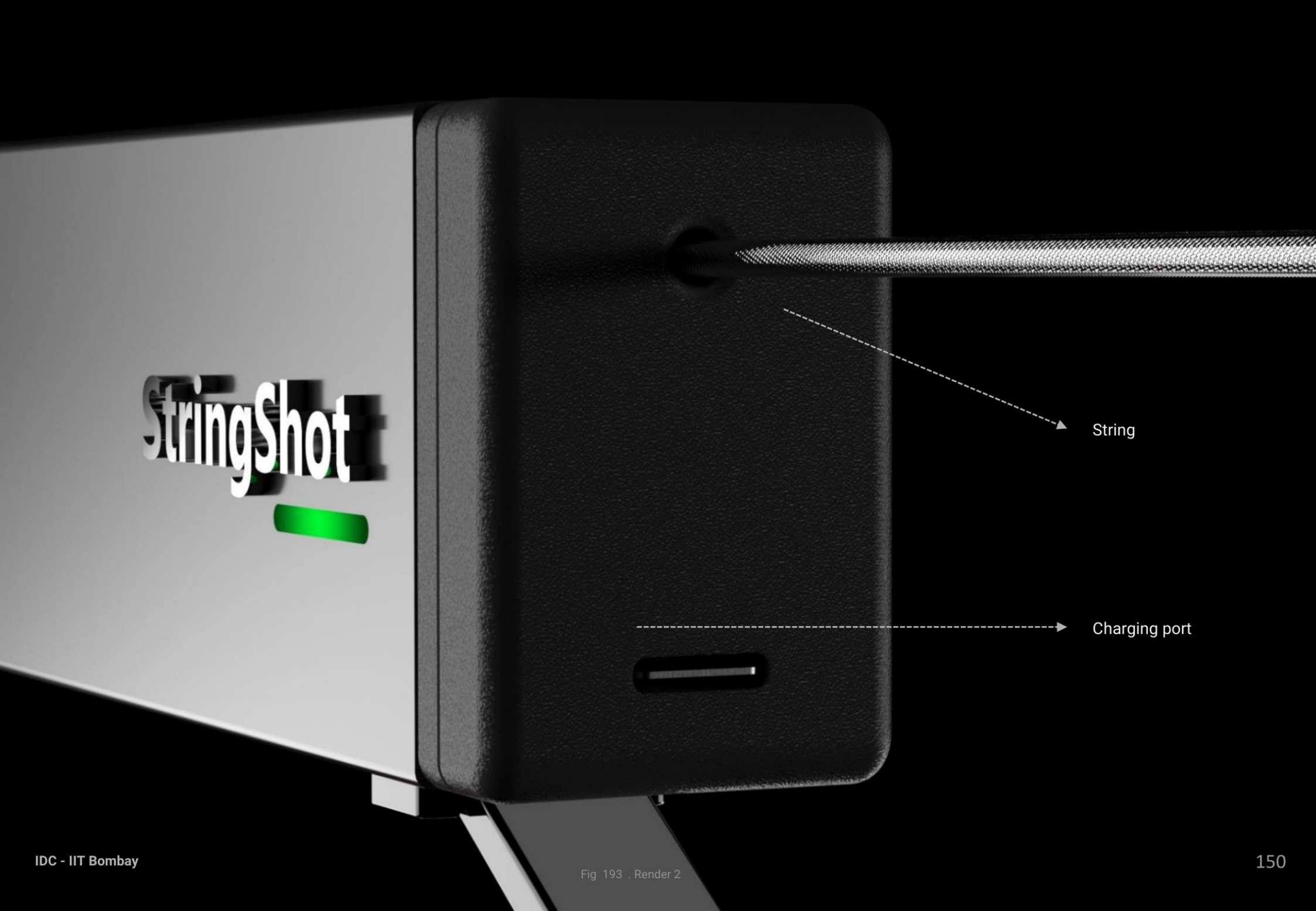
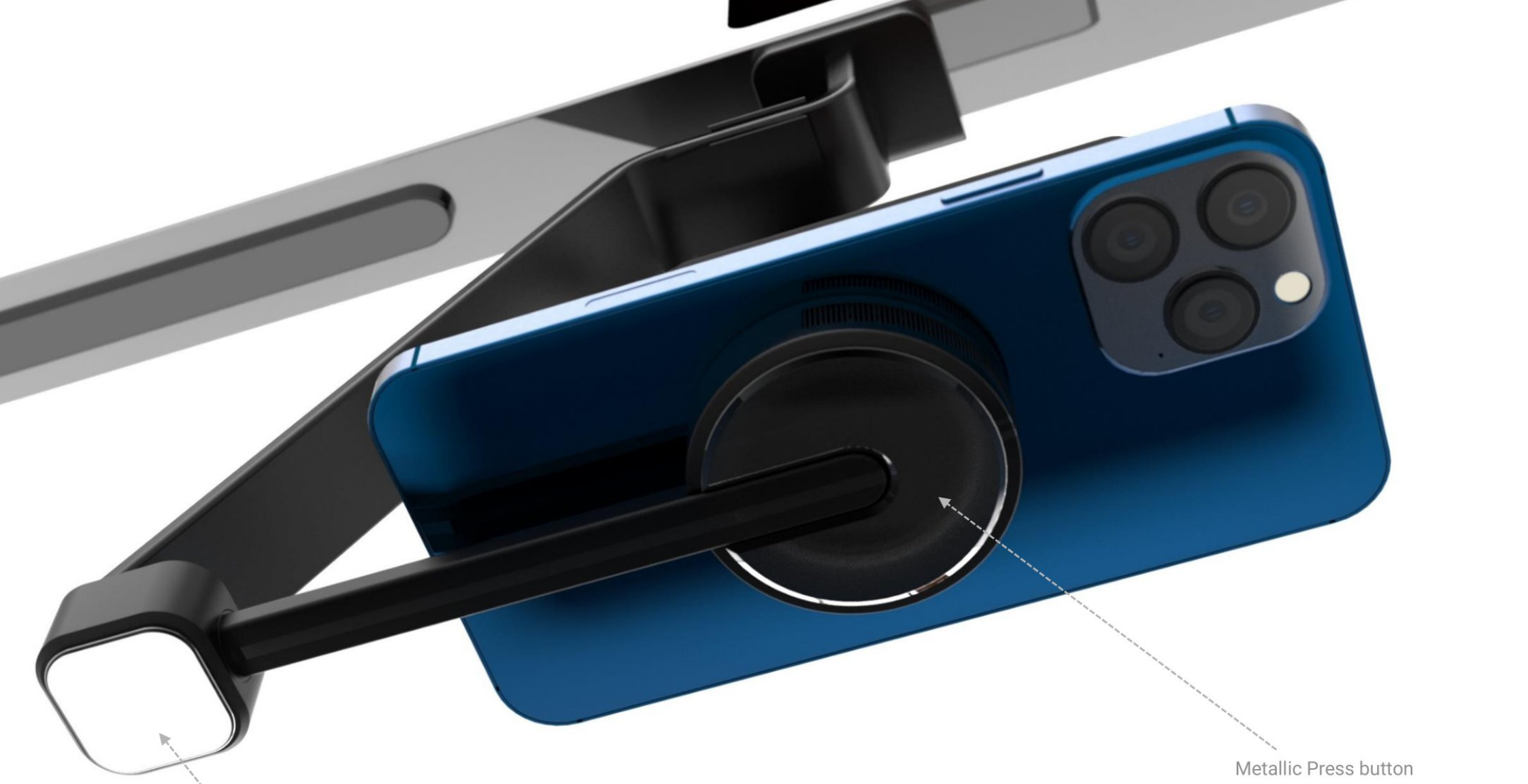


Fig 193 . Render 2


Power Button



At the bottom is a metallic plate which is also a press button used to orient the holder in the desired position. It becomes rotatable when it is pressed and it becomes steady when the force is released

Same mechanism works for the axis also.

Fig 195 . Render 4

Inside the magnetic holder there is an integrated centrifugal fan especially designed to keep the fumes away while cooking

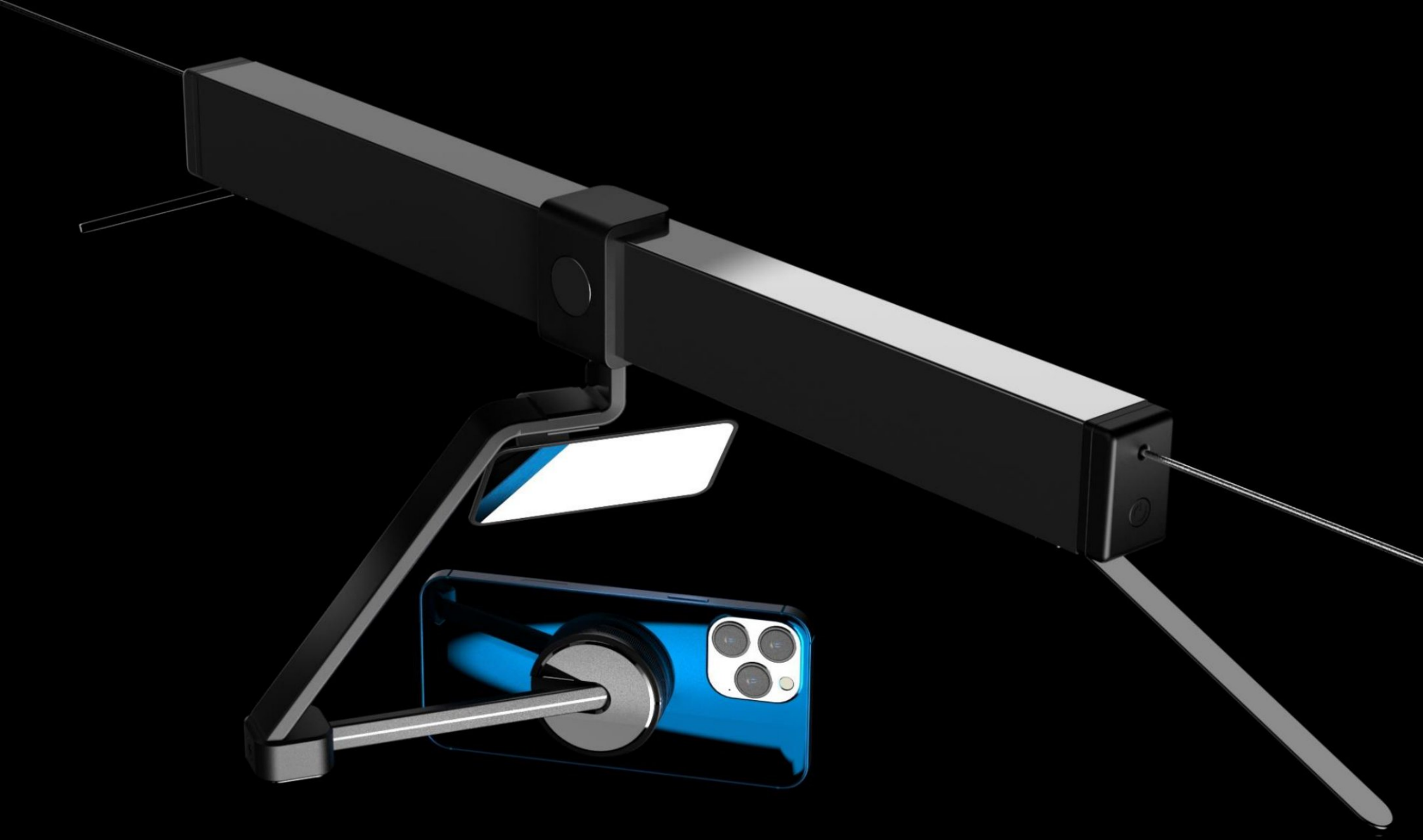
Fig 196 . Render 5

The figure shows the control button for the fan.

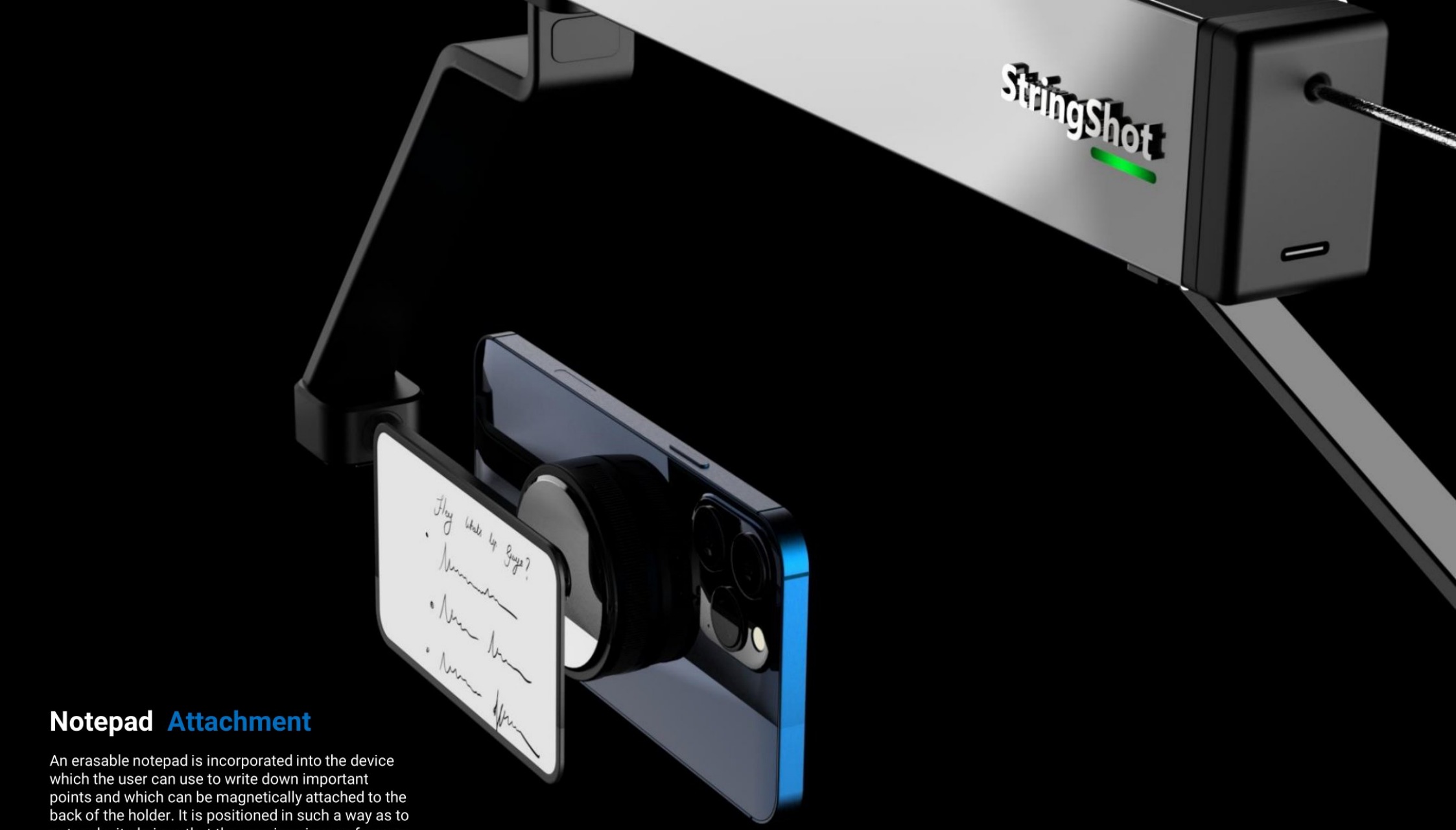
Fig 197 . Render 6

The notepad cum mirror rests on the device using a clipping mechanism. It can be attached or detached very conveniently as per the will of the user.

Fig 198 . Render 7



Stringshot can attain any orientation since center of gravity remains intact



Notepad Attachment

An erasable notepad is incorporated into the device which the user can use to write down important points and which can be magnetically attached to the back of the holder. It is positioned in such a way as to not make it obvious that the user is using a reference.

Rubber frame

Mirror

Magnetic sheet

Notepad

The cross sectional details of the mirror attachment is as showed

Fig 201. Render 9

15. Pre Jury feedback

- If possible include a feature to add one more mobile phone for simultaneous recording from a different angle

16. Updated Final Design

Fig 202 . Render 10

Swing arm

A new feature of swing arm was introduced into the product which could rotate and could hold one more additional mobile phone if required. The phone could be slid along the arm and was counter balanced by a weight on the opposite side which could be slid as well.

Fig 203 . Render 11

Rotatable
holder and arm

The rotatable arm and holder ensure that the phone can be oriented in any direction as desired by the user

Fig 204 . Render 12

End Capping details

Fig 205 . Render 13

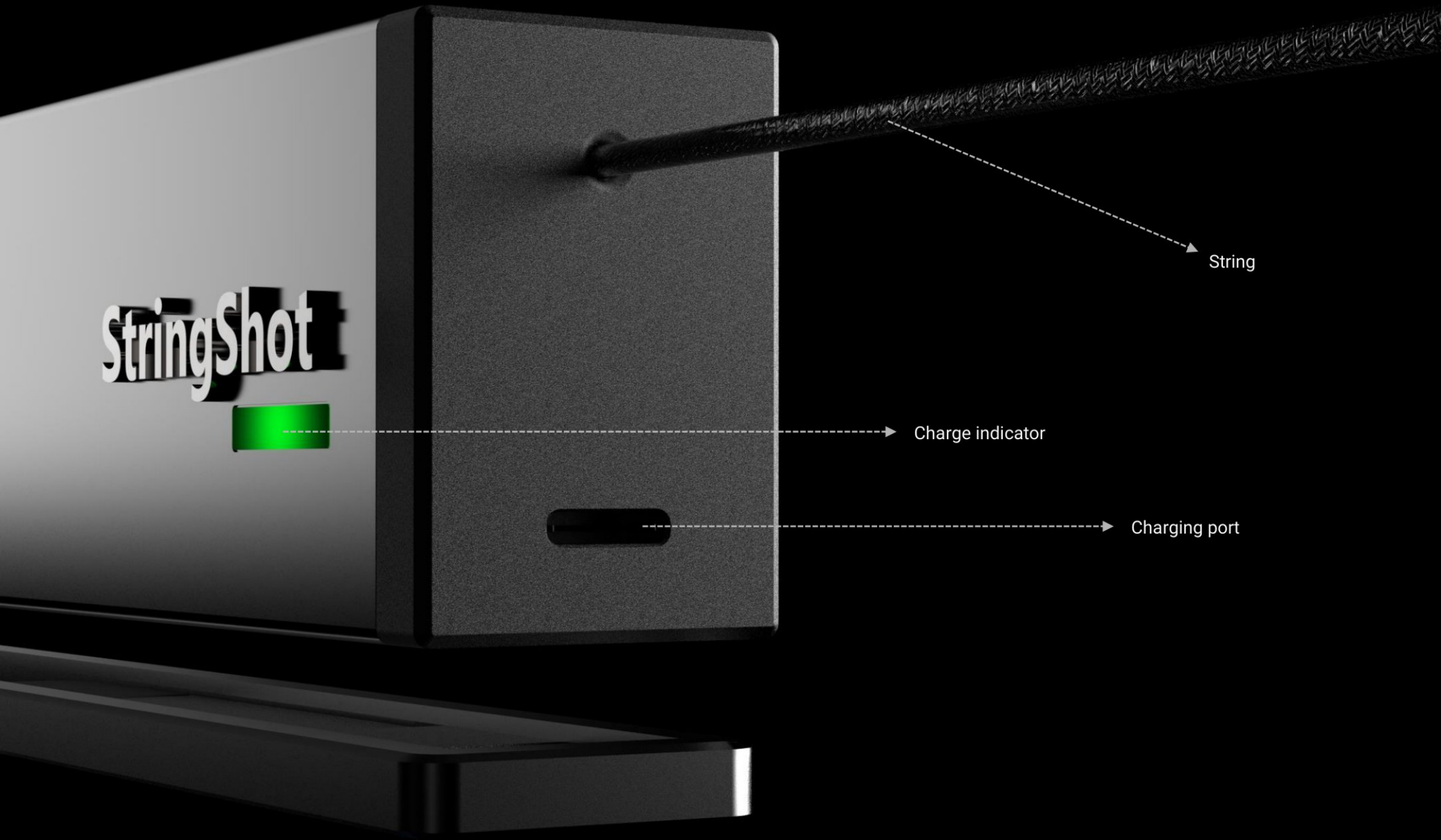


Fig 206 . Render 14

Spring loaded
LED Lights

The device would have spring loaded LED lights at the bottom which lights up to illuminate the scene. It can be used in the resting position or in the aligned position by pressing it.

Fig 207 . Render 15

Bluetooth Shutter

A Bluetooth shutter will also be provided along with the device to enable the user to control the mobile from a distance if required.

Fig 208 . Render 16

Exploded View

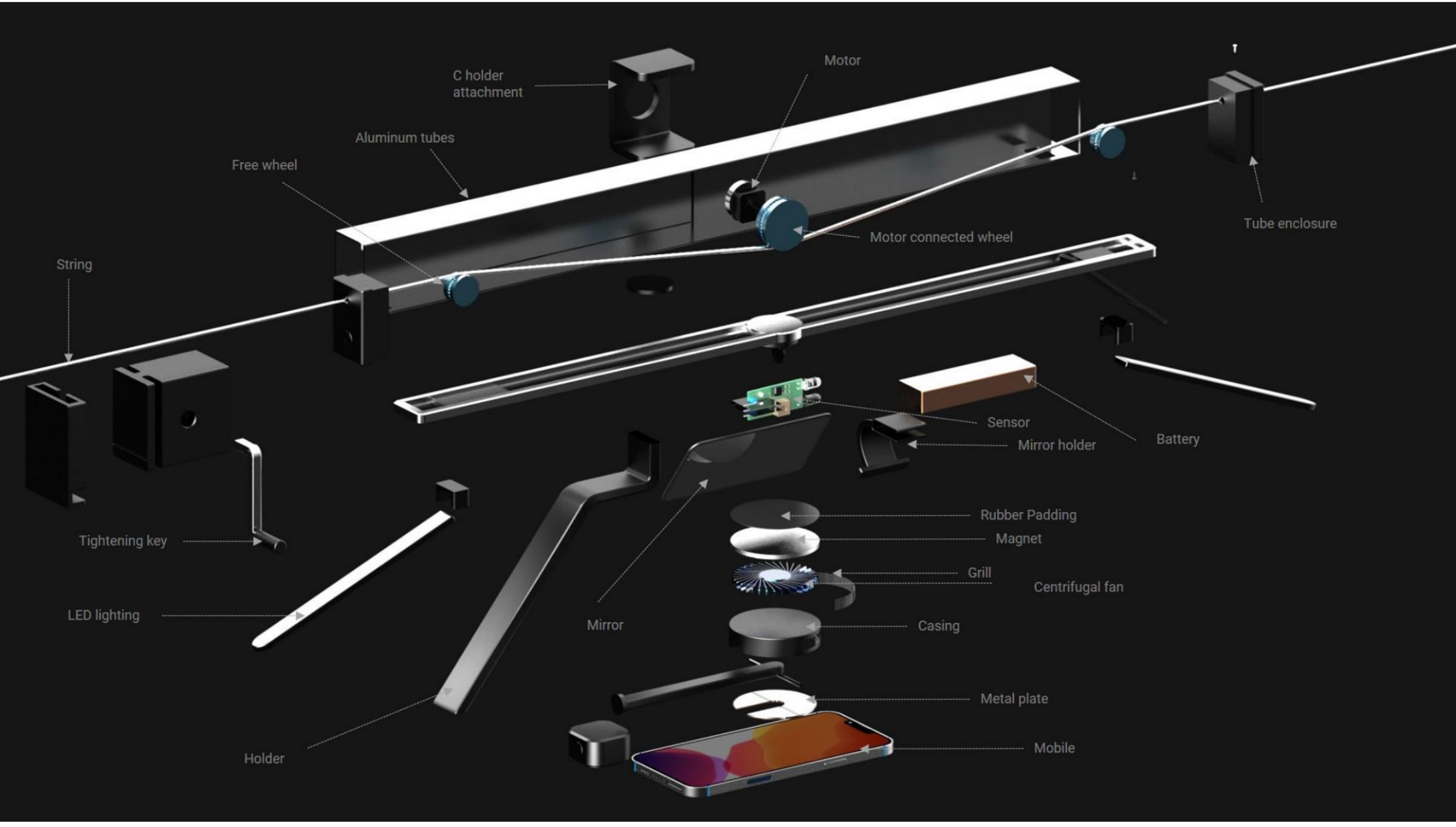
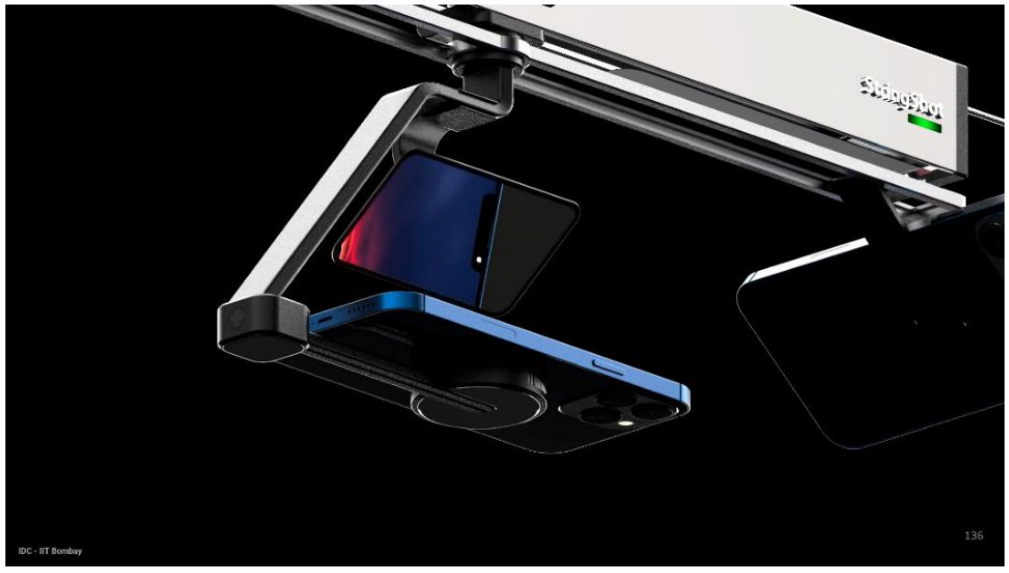
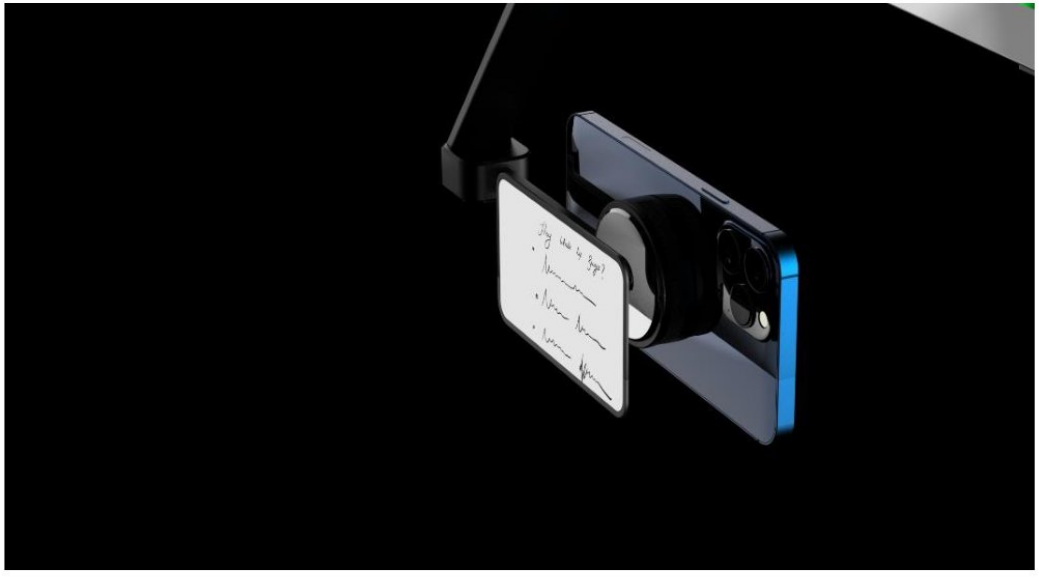


Fig 209 . Render 17

Adjustable Mirror

Behind the erasable notepad is a slightly convex mirror which can be clipped onto the holder in order to help the viewer to verify the area being shot when the mobile is oriented in the top view recording position.





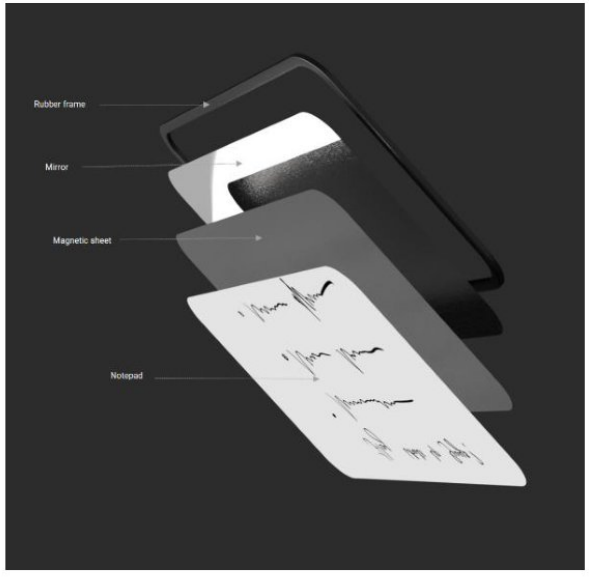


Fig 210 . Render 18

17. Final Mock Up

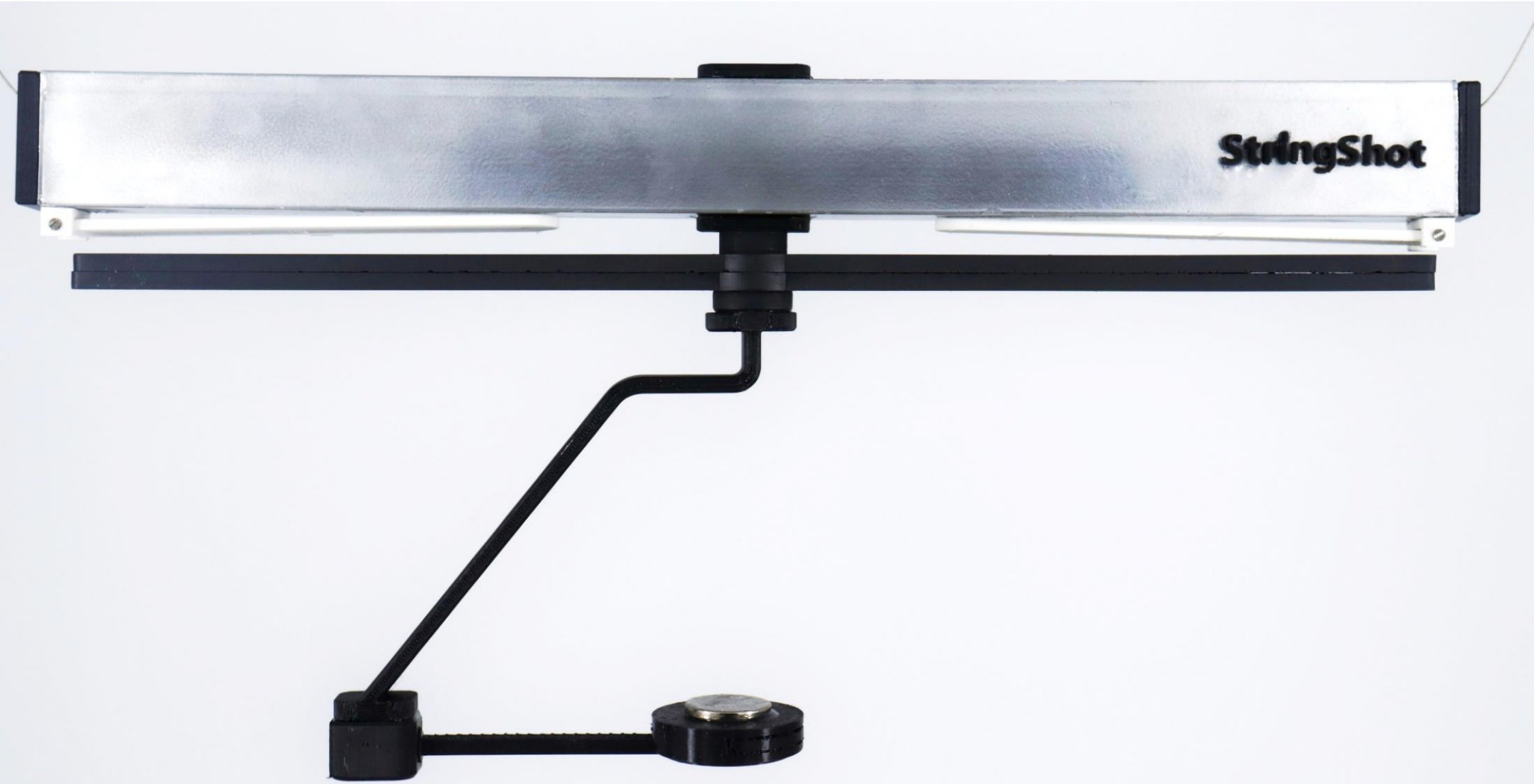


Fig 211 . Mock up 1

A final mock up was made to do the user testing and validation of the concept.

Fig 212 . Mock up 2

18. User Testing

User testing was done with a user in the kitchen environment and the results were analyzed.

The device could effectively record the scene from the top view without much hassle and without taking up any space on the kitchen top and making it crowded as in the case of a normal tripod.

Fig 213 . User testing 1

It could be easily oriented in any direction and orientation that the user indented and was convenient to use.




Fig 214 . User testing 2

19. Packaging

The device would be packed in a hard casing to ensure safe storage. Anchor bolts will be used for wall attachment to ensure that it can withstand the high tension coming on it while it is tightened. The casing would also include

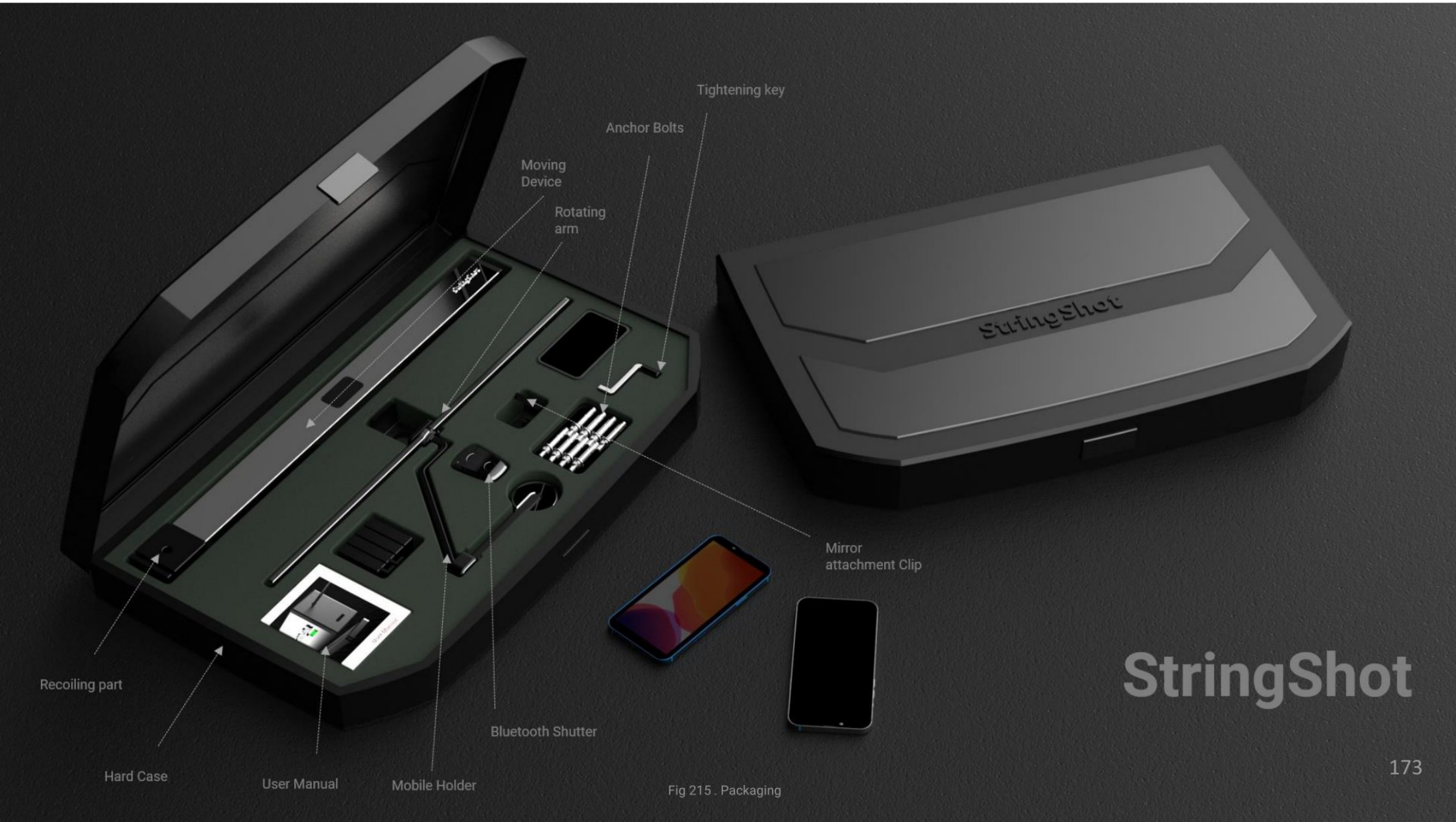


Fig 215 . Packaging

20. Issues resolved

Top View Recording

Fume interference with the lens

Difficultly in shifting and panning the camera from time to time

Inadequate lighting

Tripods taking up kitchen top space

Remembering dialogues

Not able to cross verify area being shot

21. Final Jury Comments

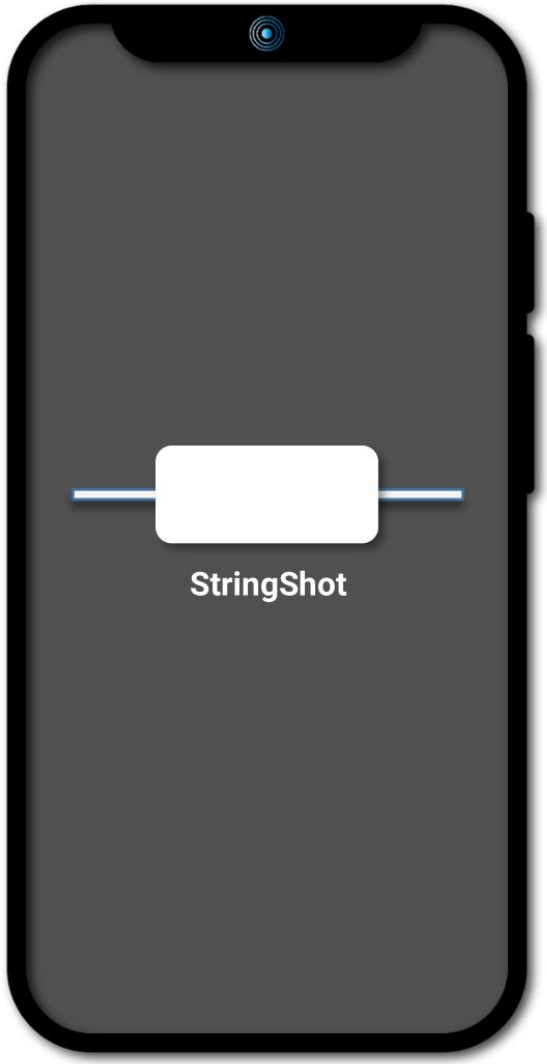
- Slight camera shaking occurred while the camera is set to a new position which could result in a blurry video. Stability is the most important factor while recording a video and it should be ensured.
- Size of the magnet used for attachment should be mentioned.
- Lighting need not be included in the device. It can be attached separately for illuminating the scene well .

22. Possible Solutions

- To ensure stability thicker strings or 2 strings on 2 sides of the end capping can be used.
- The size of the magnets used in the mock up were 2 cm diameter and was quite stable. No issues occurred. However the bigger the magnet size , the better the stability. The ideal size would be 3cm or above.
- Lighting can be excluded form the device if wanted. But it should be placed in such a position and orientation that the shadow of the device itself is not formed in the video.

23. Future Scope

- Can be Upgraded model with a Fully Automatic gesture controlled Device
- App can be developed which can control the device
- Option to Preset rotations, panning distance , moving speed and have an interactive display.



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- https://vidiq.com/blog/post/coronavirus-the-impact-on-youtube-and-youtubers/