

Conceptual Design Part
EN2160 – Electronic Design Realization
200685F – Viruthshaan V.

Content

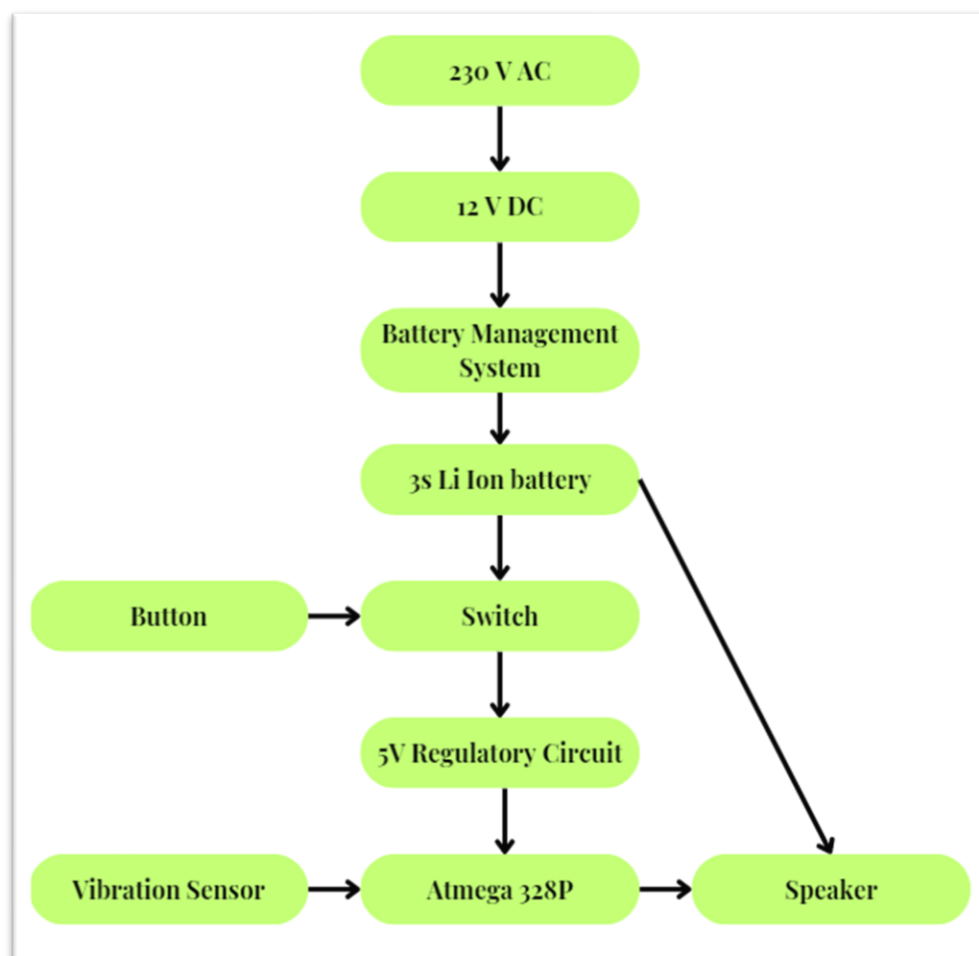
- 1) Team members who contributed.
- 2) Block Diagrams
- 3) Selection Matrix for Block Diagrams
- 4) Enclosure Sketches
- 5) Selection Matrix for Enclosure Sketches
- 6) Selected Block Diagram & Sketch

1. Team Members who contributed

- 1) 200489H Pushpakumara S.N.
- 2) 200489H Wijethunga C.K.
- 3) 200732A Samarakoon S.M.R.K.
- 4) 200556L Rathnasekara T.S.
- 5) 200529H Kishokkumar R.
- 6) 200306X Croos J.J.S.E.

2. Block Diagrams

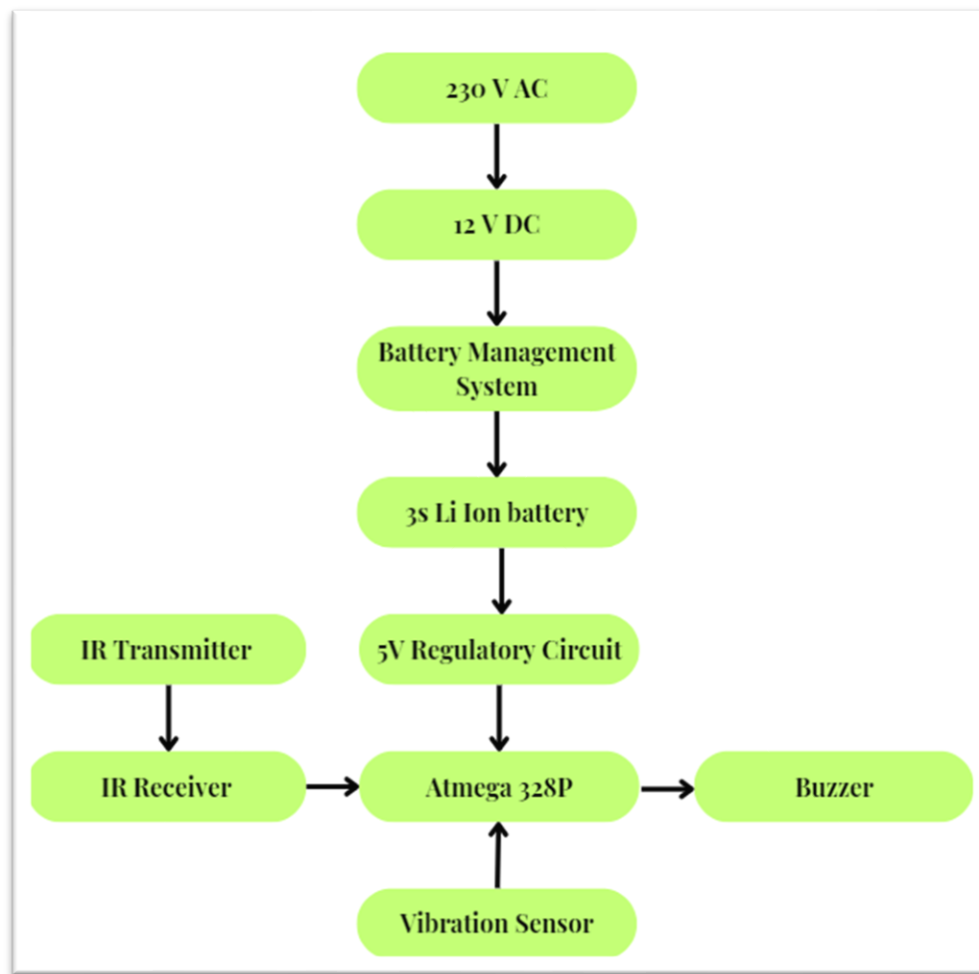
2.1 Initial Block Diagram



Features:

- 1) The battery is charged directly by the AC input.
- 2) Imported buttons and switch modules are used to turn on and off the device.
- 3) A 12V alarm with a sound output of 123 dB is employed.

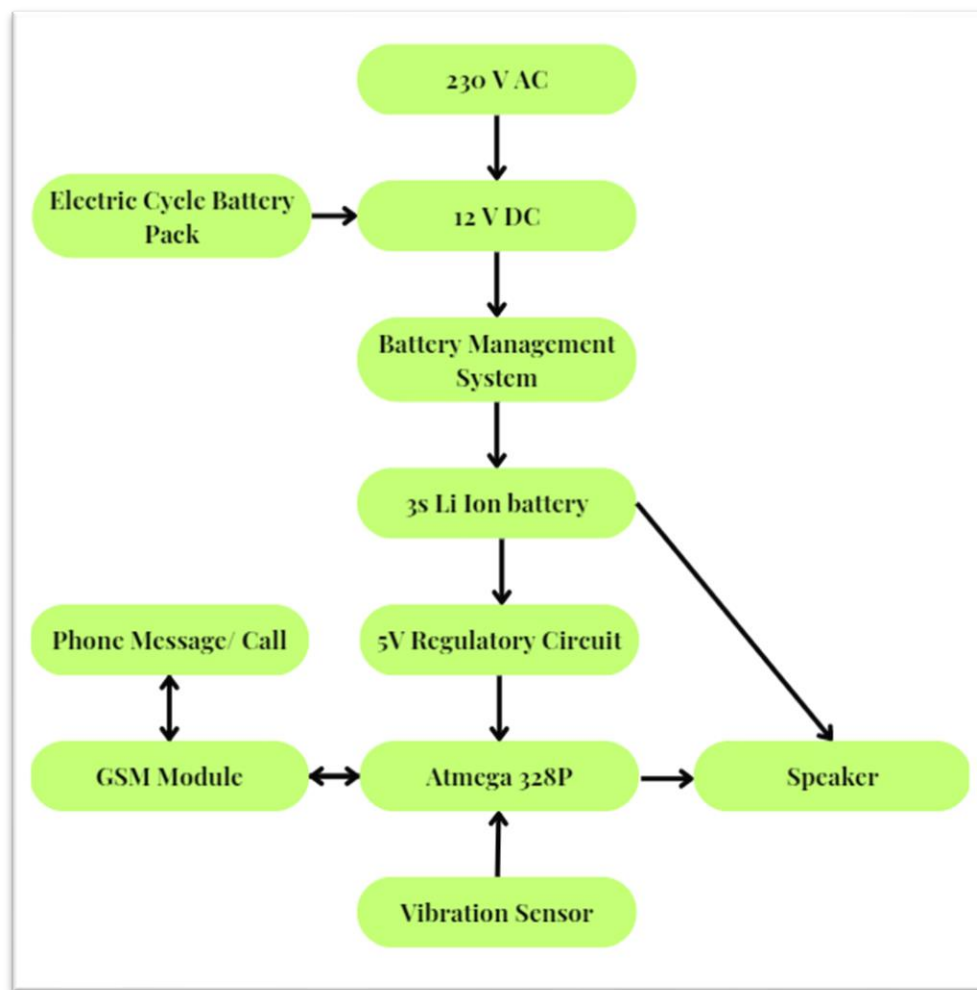
2.2 Block Diagram 1



Features:

- 1) To reduce the device size, a buzzer is employed instead of a 12V alarm, albeit with a decrease in loudness.
- 2) To create the switch module internally, IR transmitter and receiver modules are incorporated, bypassing the need for commercially available products.

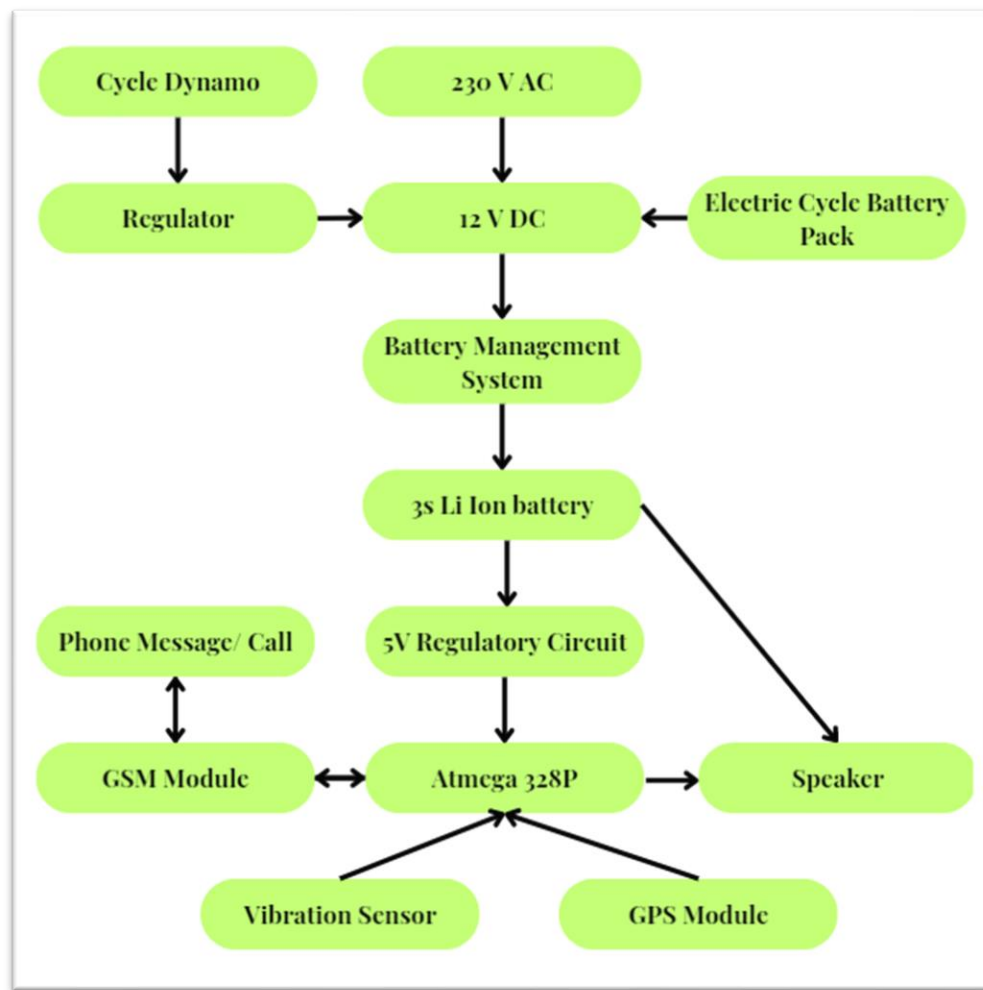
2.3 Block Diagram 2



Features:

- 1) To enhance the thief's sense of fear, a powerful 12V alarm is reintroduced.
- 2) To enable remote operation, the device replaces the IR transmitter and receiver with a GSM module, granting users control from any location.
- 3) In addition to the speaker output, the user will receive an alert call whenever there is any contact with the cycle.
- 4) For electric cycles, the device can be directly connected to the electric battery pack, enabling extended device operation.

2.4 Block Diagram 3



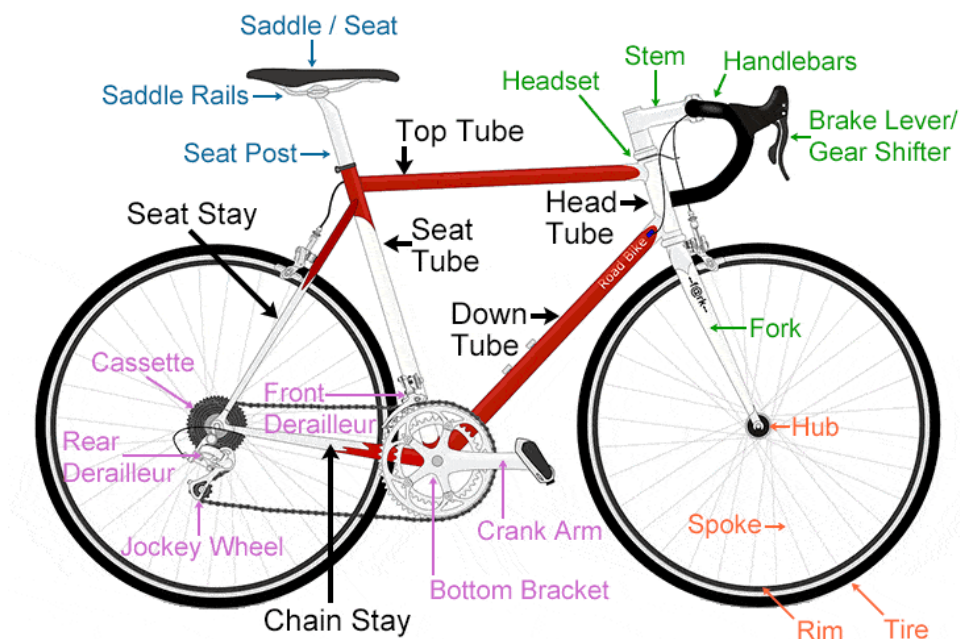
Features:

- 1) A GPS module is incorporated to track and share the location of the cycle in the event of theft.
- 2) A dynamo, coupled with a regulator, is being considered as a power source for the device.

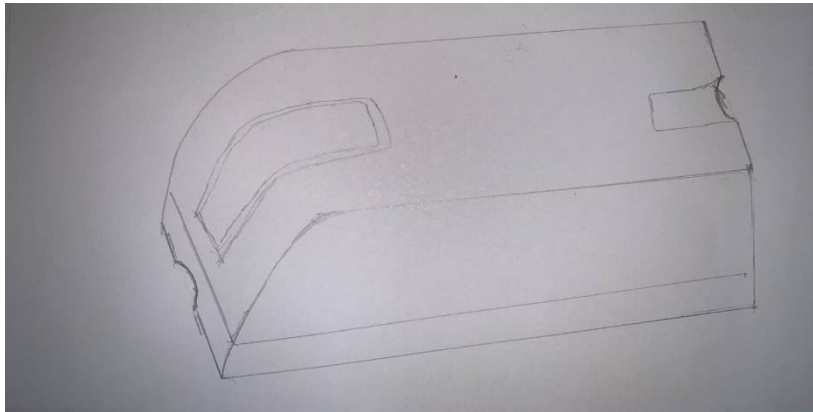
3. Selection Matrix for Block Diagrams

Criteria	Initial	BD 1	BD 2	BD 3
Functionality	6	6	8	9
Ease of Integration	9	8	8	6
Cost	9	8	7	5
Energy	8	8	7	6
Reliability	4	4	8	9
Scalability	7	8	9	9
Time Duration per charge (How long will it work continuously if it charged once)	8	7	6	4
Size of Components (Larger size – lower marks)	8	9	7	7
Total	59	58	60	55

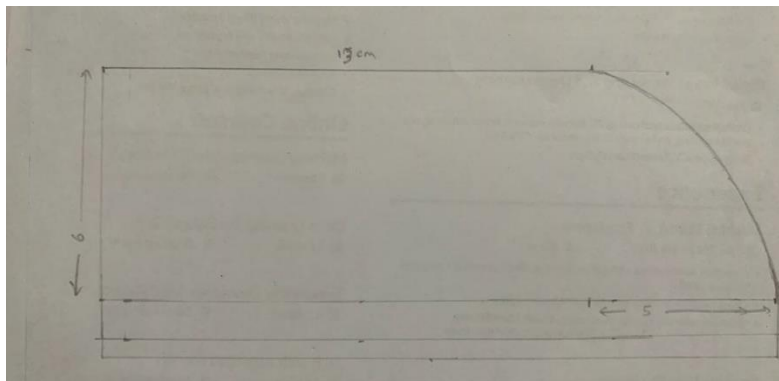
4. Enclosure Sketches



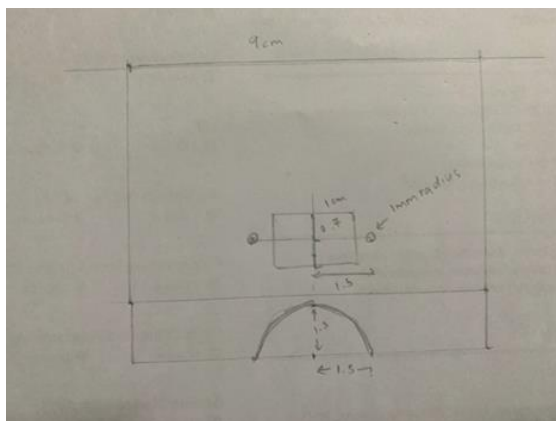
4.1 Initial Enclosure Sketch



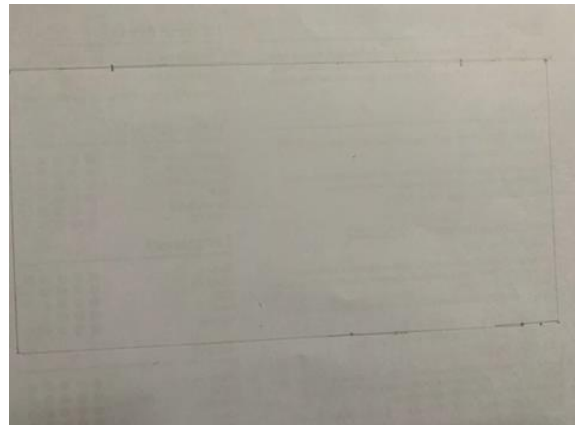
Side View



Right View



Top View



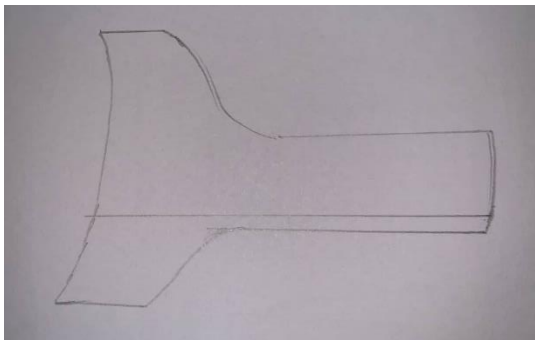
Features:

- 1) Nuts and bolts are used to securely fasten the various components of the bicycle frame.
- 2) Can be attached to the top tube, down tube, or seat tube of the bicycle.

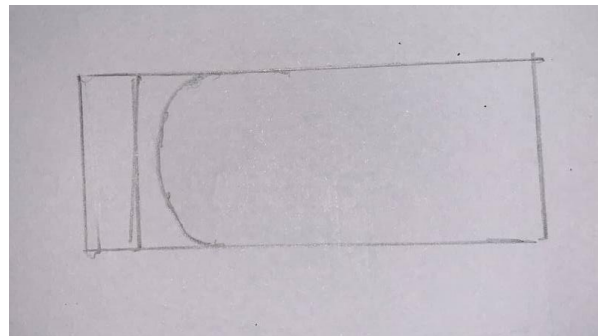
4.2 Enclosure Sketch 1



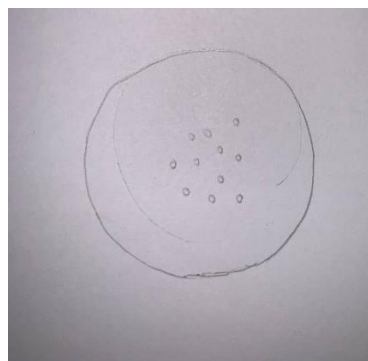
Side View



Top View



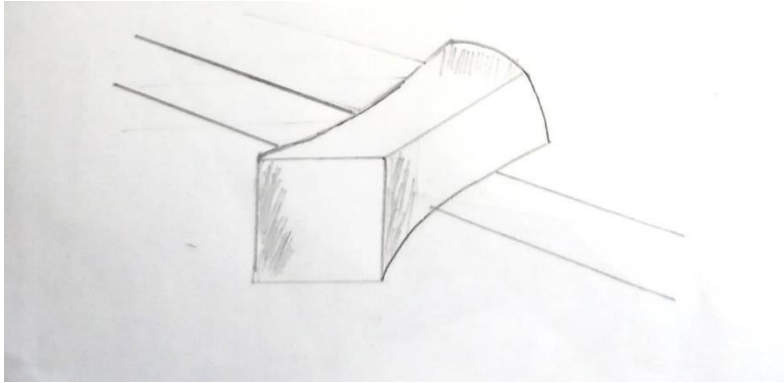
Right View



Features:

- 1) Specially designed for easy installation on the handlebars.
- 2) Compact in size and adjustable to fit various handlebar sizes.

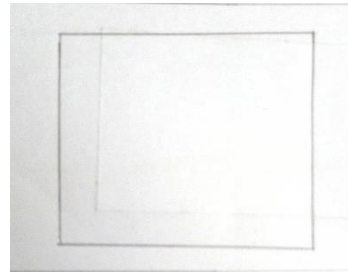
4.3 Enclosure Sketch 2



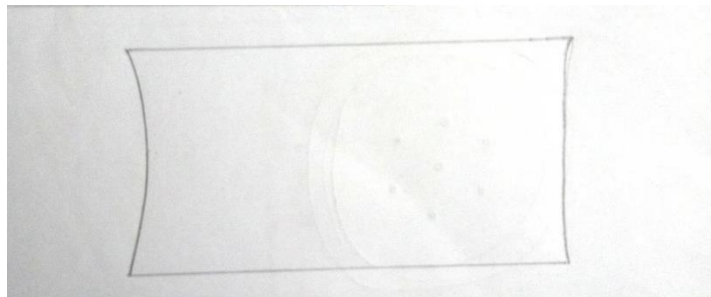
Top View



Right View



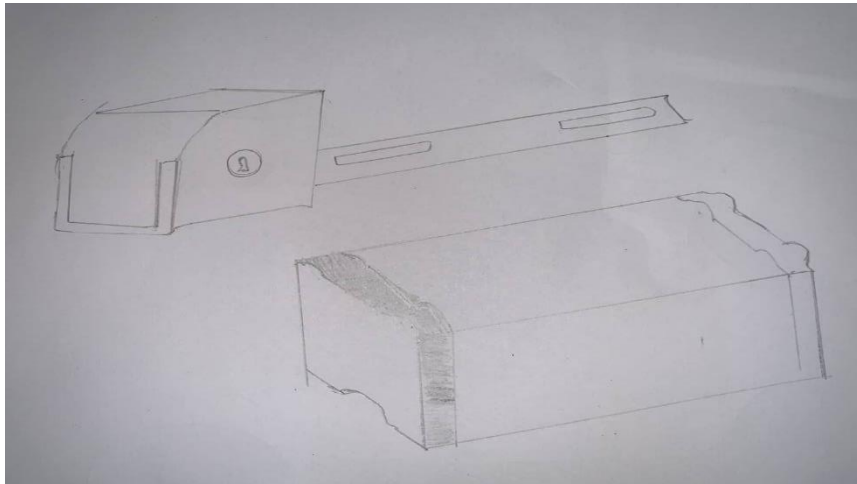
Side View



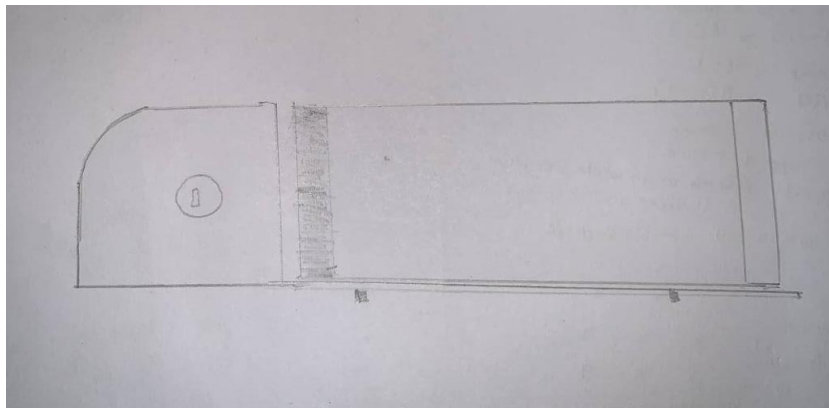
Features:

- 1) Specially designed for easy installation on the handlebars.
- 2) Features an enhanced aesthetic compared to the previous design.

4.4 Enclosure Sketch 3

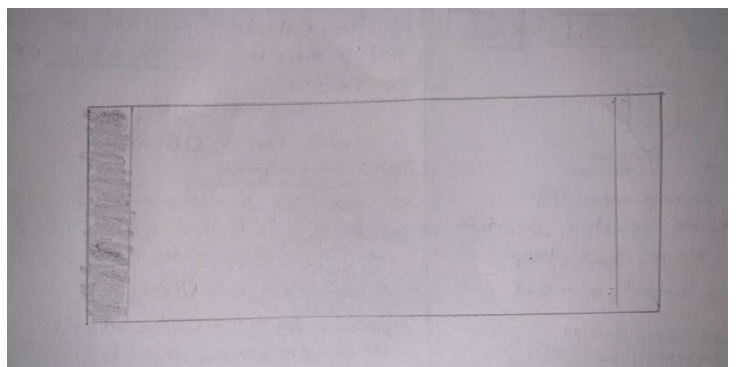
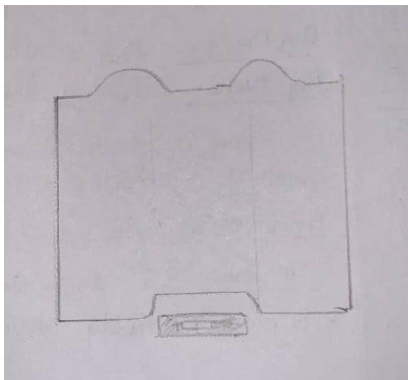


Side View



Right View

Top View



Features:

- 1) Designed to be securely attached to the down tube.
- 2) A metal bar is affixed to the bicycle frame, serving as a locking mechanism to secure all the components in the top part. It can be locked and unlocked using a key and lock.

5. Selection Matrix for Enclosure Sketches

Criteria	Initial	ES 1	ES 2	ES 3
Ease of Integration	9	7	7	9
Cost	7	9	9	6
Size (Small size – higher marks)	7	9	9	6
Spacious (Whether the space is enough to include all the components)	9	5	5	8
Easy to repair.	9	7	7	7
Scalability (Adding more components to the device)	9	4	4	9
Aesthetics	7	9	9	8
Durability	8	5	3	9
Functionality (Functions that can be included)	8	5	5	9
Total	73	60	58	71

6. Selected Block Diagram & Sketch

Based on the evaluation criteria, the third block diagram was selected, and the initial enclosure was chosen.

However, considering the cost factor, it is preferable to develop two types of products. One type would utilize the initial block diagram, targeting customers seeking a more affordable price point. This is because the third option involves incorporating a 4G GSM module, which incurs an estimated cost of around 11,000 rs.

In summary, the first enclosure design adequately accommodates the components we intend to use.

