CLAP ACTIVATED LOCATOR DEVICE
ANTI SLEEP ALARM GLASSES

20EC5203- ELECTRONIC DESIGN PROJECT I

A PROJECT REPORT

Submitted by

POOJA S V

in partial fulfilment for the award of the degree

of

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(An Autonomous Institution, Affiliated to Anna University Chennai and Approved by AICTE, New Delhi)

SAMAYAPURAM – 621 112

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K. RAMAKRISHNAN COLLEGE OF TECHNOLOGY (AUTONOMOUS)

SAMAYAPURAM - 621 112

BONAFIDE CERTIFICATE

Certified that this project report titled "**CLAP ACTIVATED LOCATOR DEVICE, ANTI SLEEP ALARM GLASSES "** is the Bonafide work of **POOJA S V (811722106074)** who carried out the project under my supervision. Certified further, that to the best of my knowledge the work reported herein does not from part of any other project report or dissertation on the basis of which a degree or award was conferred on an earlier occasion on this or any other candidate.

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Submitted for the viva-voce examination held on ……

INTERNAL EXAMINER **EXTERNAL EXAMINER**

DECLARATION

I jointly declare that the project report on "**CLAP ACTIVATED LOCATOR SERVICE, ANTI SLEEP ALARM GLASSES"** is the result of original work done by us and best of our knowledge, similar work has not been submitted to "**ANNA UNIVERSITY CHENNAI**" for the requirement of Degree of **BACHELOR OF ENGINEERING**. This project report is submitted on the partial fulfilment of the requirement of the award of Degree of **BACHELOR OF ENGINEERING**.

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Place: Samayapuram

Date:

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LIST OF ABBREVIATIONS

MIC	Microphone
LED	Light Emitting Diode
IC	Integrated Circuit
ADC	Analog to Digital Converter
SNR	Signal-to-Noise Ratio (microphone performance metric)
IR	Infrared
DC	Direct Current
AC	Alternating Current
NPN	Negative-Positive-Negative
PNP	Positive-Negative-Positive
RL	Relay
NO/NC	Normally Open/Normally Closed
BJT	Bipolar Junction Transistor
PWM	Pulse Width Modulation
TTL	Transistor-Transistor Logic
EMF	Electromotive Force
IRR	Infrared Reflection Ratio
SPST	Single Pole Single Throw
BAT	Battery
SPKR	Speaker

CHAPTER – 1

COMPONENTS

1.1 BREAD BOARD:

A breadboard serves as an indispensable tool in the realm of electronics, providing a versatile platform for the assembly and testing of electronic components. Comprising a rectangular board with a grid of interconnected holes, the breadboardis designed to offer a user-friendly environment that facilitates the creation of electronic circuits without the need for soldering. The grid arrangement follows rowsand columns, and within each row, multiple holes are electrically connected. Beneaththe surface of the board, metal clips establish electrical connections, allowing for thecreation of intricate circuits without the permanency associated with solderedconnections.

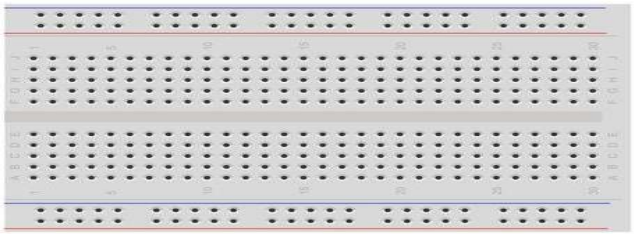

Figure 1.1 Bread board

In addition to its grid structure, breadboards typically feature power rails along the sides, commonly colored in red and blue. These power rails provide accessible points for connecting power sources, whether they be batteries or external power supplies.The ease of access to power facilitates the testing and experimentation of circuits. Connecting wires play a crucial role in establishing electrical connections between various components on the **1**breadboard.

1.2 LED:

Light Emitting Diodes (LEDs) represent a groundbreaking technology with wide- ranging applications across diverse industries. Functioning on the principle of electroluminescence, LEDs emit light as a result of electrons moving within a semiconductor material. The advantages of LEDs are manifold. They excel in energy efficiency by converting a significant portion of electrical energy into visible light, surpassing traditional incandescent bulbs that dissipate a substantial amount as heat. This not only contributes to lower electricity bills but also aligns with global efforts towards energy conservation. The durability of LEDs is a key asset, attributed to their solid-state construction, lacking delicate components like filaments or glass bulbs.

Figure 1.2 LED

Beyond their use in indicators and displays, LEDs play a pivotal role in driving technological advancements. Their low power consumption makes them ideal for battery-operated devices, while their contribution to energy efficiency aligns with sustainability goals. In the automotive industry, LEDs are extensively used in headlights and taillights, improving visibility and safety. The continual evolution of LED technology underscores its importance in shaping a more sustainable and technologically advanced future. As research and development in this field progress, LEDs are likely to play an even more central role in addressing global energy challenges and fostering innovation across a myriad of application.

1.3 POWER SUPPLY:

A battery stands as a fundamental component in the realm of portable electronics, operating as a versatile electrochemical device designed to store and deliver electrical energy through a controlled chemical reaction. Typically composed of one or more electrochemical cells, a battery consists of positive (cathode) and negative (anode) electrodes immersed in an electrolyte solution. The chemical interaction between these components, when a circuit is closed, triggers a reaction that results in the flow of electrons, generating electrical energy. Alkaline batteries, for instance, are ubiquitous in everyday devices due to their reliability and cost-effectiveness. Lithium-ion batteries, renowned for their high energy density and rechargeable nature, are prevalent in various applications, including smartphones and electric vehicles. Nickel-cadmium batteries, also rechargeable, find their niche in portable electronics, offering a balance between efficiency and longevity. Alkaline batteries are ideal for low-drain devices, while lithium-ion batteries shine in applications demanding compactness and high energy storage.

Figure :1.3 Battery

Rechargeable batteries, a notable category, contribute significantly to sustainability efforts by minimizing waste and promoting resource efficiency. Particularly economical for devices with frequent usage patterns, rechargeable batteries not only reduce environmental impact but also prove cost-effective over time.

1.4 RESISTOR:

A resistor is a fundamental electronic component that opposes the flow of electric current. It is a passive two-terminal device with the primary function of controlling or limiting the amount of current passing through a circuit. Resistors are crucial in electronics for adjusting voltage levels, protecting components from excessive currents, and defining time constants in various applications. Resistors come in various types, including fixed resistors with specific resistance values and variable resistors like potentiometers and rheostats that allow manual adjustment. The resistance of a resistor is measured in ohms (Ω) and is governed by Ohm's Law, which relates the voltage (V), current (I), and resistance (R) in a circuit through the equation $V = I \times R$. In electronic circuits, resistors play essential roles in voltage dividers, signal conditioning, and setting bias points for active devices like transistors.

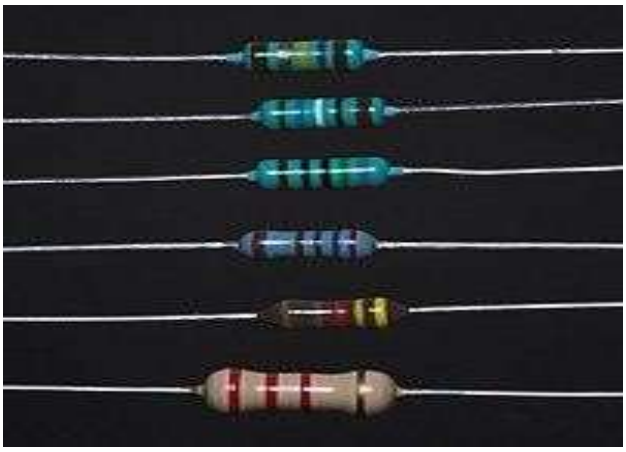

Figure 1.4 Resistor

Moreover, in setting bias points for active devices like transistors, resistors contribute to stabilizing and controlling the operation of these components. They are also employed in filters, oscillators, and numerous other applications where precise control of electrical parameters is necessary. Resistors are foundational components in circuit design, offering control and stability in the flow of electric current, contributing to the overall functionality and performance of electronic systems.

1.5 CAPACITOR:

A capacitor is a fundamental electronic component that stores and releases electrical energy in a circuit. It consists of two conductive plates separated by an insulating material called a dielectric. When a voltage is applied across the plates, an electric field is established, causing the accumulation of positive and negative charges on the respective plates. Capacitors are versatile components with various applications in electronics. They play a crucial role in smoothing voltage fluctuations, filtering signals, and providing energy storage in circuits. The ability to store electrical energy temporarily makes capacitors valuable in timing circuits, coupling AC and DC signals, and decoupling power supplies. Capacitors come in different types, including electrolytic capacitors, ceramic capacitors, and tantalum capacitors, each with specific properties suited to different applications. The capacitance of a capacitor, measured in farads (F), indicates its ability to store charge.

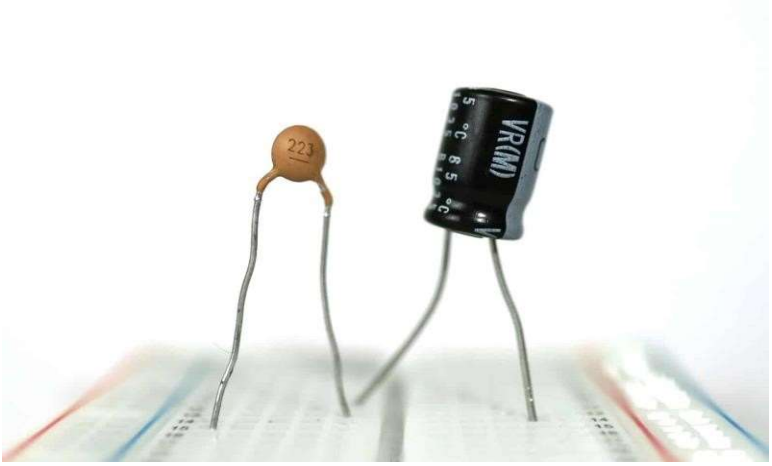

Figure 1.5 Capacitor

In electronic circuits, capacitors are essential for stabilizing power supplies, eliminating noise, and facilitating the proper functioning of various electronic components. They play integral roles in audio systems, power amplifiers, filters, and numerous other electronic devices, contributing significantly to the efficiency and performance of electrical systems

1.6 BUZZER:

A buzzer, a straightforward yet essential component in electronics, functions as an audio signaling device designed to produce sound when an electrical current is applied. Operating as a transducer, the buzzer converts electrical energy into audible sound waves, making it a valuable component for providing alerts and notifications in various electronic devices. The basic construction of buzzers typically involves a vibrating element, which could be a diaphragm or a piezoelectric crystal, and an electromagnetic coil. When an electric current flows through the coil, it generates a magnetic field. This magnetic field interacts with the vibrating element, causing it to vibrate and produce sound waves.

Figure 1.6 Buzzer

The vibration frequency determines the pitch or tone of the sound emitted by the buzzer. Buzzers serve a wide range of applications, finding use in alarms, timers, notification systems, and any scenario where an audible alert is necessary. In electronic circuits, the operation of buzzers is often controlled by oscillators or timer circuits. Their working range is usually very wide, spanning over 3V to 24V. Their power consumption is extremely low and quite durable for extreme settings. Buzzers can be easily integrated into devices like alarms, toys, household appliances.

1.7 TRANSISTOR:

A transistor, a pivotal semiconductor device, stands as a cornerstone in the world of electronics due to its remarkable ability to amplify signals and act as a switch. Representing a fundamental building block in electronic circuits, transistors offer versatility and are integral to a broad spectrum of applications, ranging from amplifiers and oscillators to digital logic circuits. The two primary types of transistors are bipolar junction transistors (BJTs) and field-effect transistors (FETs), each with its own variations. BJTs, categorized as NPN (negative-positive-negative) and PNP (positive-negative-positive), involve the movement of charge carriers between two semiconductor materials. On the other hand, FETs encompass types like MOSFETs (Metal-Oxide-Semiconductor Field-Effect Transistors) and JFETs (Junction Field-Effect Transistors), relying on the modulation of conductivity within a channel. This ability to amplify signals is harnessed in various devices, including audio amplifiers that drive speakers, radio-frequency amplifiers in communication systems, and operational amplifiers in instrumentation, For the transistor BC547.

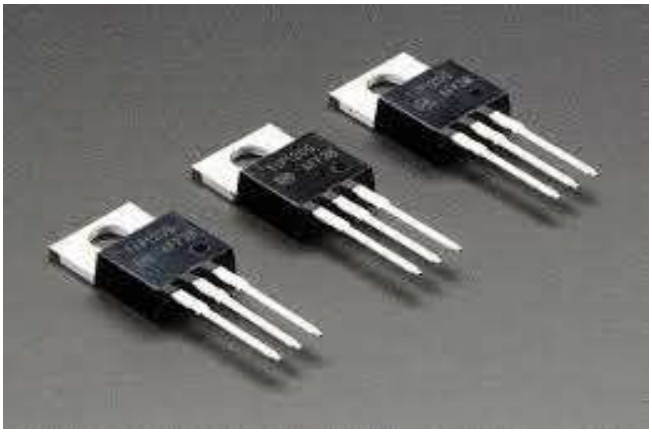

Figure 1.7 Transistor

The compact size, low power consumption, and reliability of transistors have been instrumental in the miniaturization and advancement of electronic technology.

1.8 FEMALE JUMPER WIRE:

Female jumper wires are an extremely versatile connector used in a very wide range of electronics projects. At one or both ends of the jumper wire, they have sockets so that the jumper can be connected with male pins, headers, and other components. They are available in various lengths, colors, and wire gauges. Female jumper wires are mostly used as links between microcontrollers, breadboards, and sensors without the need for soldering, therefore being reusable and flexible in the process.

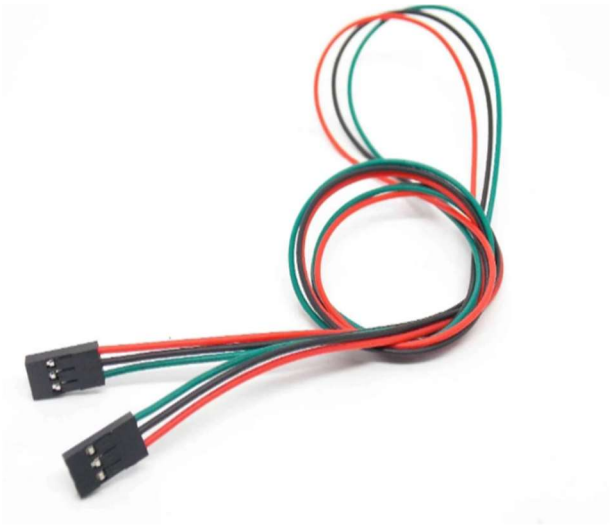

Figure 1.8 Female Jumper wire

Their connectors are designed to fit snugly onto standard 0.1-inch (2.54 mm) pitch male pins, ensuring a secure connection. For customization, female jumper wires can be cut and stripped to fit specific requirements. Some projects may require crimping new connectors, making them suitable for both temporary setups and permanent installations. This wire has special applications where neat, organized layouts are called for and in multiple component interconnections within a circuit. Their flexibility and reusability make them an excellent choice for hobbyists, as well as professionals in electronics systems, who often have to simplify building and debugging a circuit.

1.9 MALE – FEMALE FUMPER WIRE:

Male-female jumper wires allow for flexibility in connecting disparate electronic components by combining a male pin on one end and a female socket on the other. They fill the gaps between male headers, breadboards, and female sockets, making them an essential part of any prototyping and modular circuit design. The male end of the jumper wire can directly be plugged into a breadboard or female connector. The female end of the jumper wire connects to male pins, such as those on microcontroller boards or sensor modules. This makes it possible to interface different components without using any adapters. Male-female jumper wires are available in various lengths and colors that help in neat and efficient circuit layouts.

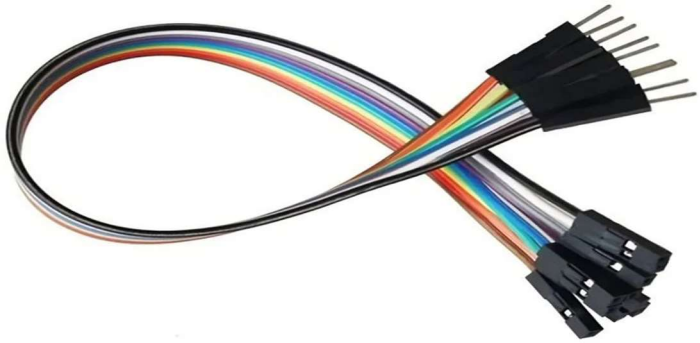

Figure 1.9 Male – Female Jumper wire

Easy customization - they can be cut into required lengths and fitted with crimped connectors, if needed. They're highly rugged, and multiple insertions and removals would have little effect on their overall structure. Applications where high assembly and disassembly speed are essential, such as in robotics, IoT projects, or testing environments, need such wires. Their adaptability makes male-female jumper wires a practical solution for hobbyists and professionals in order to ensure reliable and efficient connections in any electronics setup.

1.10 TRANSPARENT GLASS:

One of the common applications for clear, see-through transparent glasses is in daily use or in special purposes due to their protection for the eyes and their clarity. Such glasses are made of material, either glass or polycarbonate, and offer toughness along with optical clarity. The glasses are available in the forms of prescription, safety glasses, and even as part of fashion eyewear. In electronics and engineering contexts, transparent safety glasses are used to protect the eyes from potential hazards such as flying debris, dust, or chemical splashes. They are light in weight, comfortable, and sometimes treated with anti-glare or anti-scratch coatings for better visibility and longevity.

Figure 1.10 Transparent Glass

Transparent glass is a versatile material widely used for both daily and specialized applications due to its optical clarity and durability. Made from materials like glass or polycarbonate, it offers toughness and high transparency, making it ideal for various purposes. In eyewear, transparent glasses serve as prescription lenses for vision correction, safety glasses to protect against hazards like debris and chemical splashes, and as fashionable accessories blending style with function. In engineering and electronics, these glasses are indispensable, providing protection in laboratories, construction sites, and manufacturing environments.

1.11 CONNECTING WIRES:

Connecting wires form the indispensable infrastructure of electronic circuits, serving as the vital conduits that establish electrical pathways and facilitate the seamless flow of electric current. These wires, typically composed of conductive materials like copper or aluminum, play a fundamental role in ensuring the proper functioning of circuits, both on breadboards and within complex electronic systems. The primary function of connecting wires is to link various components within a circuit, creating the necessary electrical connections for the circuit to operate as intended.

Figure 1.11 Connecting wires

Their conductivity allows for the transmission of electrical signals between different elements, forming the essential links that enable communication and cooperation among circuit components. Beyond their basic role in establishing electrical connections, connecting wires contribute significantly to the organization and structure of circuit layouts. Their flexibility allows for the creation of specific signal paths, aiding in the systematic arrangement of components. Different lengths accommodate diverse circuit layouts, while distinct colors aid in visually distinguishing between various connections. This visual clarity becomes particularly crucial during the prototyping and experimentation stages of electronic system development, where designers and engineers need to troubleshoot and optimize circuit configurations.

1.12 SINGLE POLE SINGLE THROW (SPST) TOGGLE SWITCH:

A Single Pole Single Throw (SPST) toggle switch is an essential component for simple and effective control. This type of switch is perfect for applications where you need to establish or interrupt a connection in a single circuit. It features two terminals: one connected to the power source and the other to the load, making it straightforward to integrate into any electronic or electrical setup. The SPST toggle switch can be used to control the operation of a specific device or functionality, such as turning a motor, LED, or other components on and off. The simplicity of its design ensures reliability and ease of use. For instance, it can act as the main controller for powering a device like a fan or activating a specific feature. The switch also offers durability and is widely available in various sizes and styles, making it suitable for different design requirements. Its compact nature allows it to be easily embedded into an enclosure, ensuring a clean and professional look. Incorporating an SPST toggle switch enhances usability and provides a convenient way to manage functions.

Figure 1.13 Single Pole Single Throw (SPST) toggle switch

It contains a single input pole, which is connected to one output, so that the circuit either is closed or open, and it can either be ON or OFF. It is designed using the simple toggle mechanism. Its switching mechanism involves the flip action of a lever. Due to its simplicity, it comes in many different current and voltage ratings.

1.14 RELAY MODULE

A relay module is an electrical switch that uses an electromagnet to control a mechanical switching mechanism, allowing a low-power control signal to manage a high-power load safely and effectively. It is commonly used to interface low-voltage control circuits, such as microcontrollers, with high-power devices like lights, motors, or household appliances. The module typically includes input pins for the control signal and output terminals for the load, with options for Normally Open (NO) and Normally Closed (NC) configurations to suit different applications. It provides electrical isolation between the control and power circuits, ensuring safety and reliability. Many relay modules also feature indicator LEDs to show their operational status. Widely used in home automation, industrial control systems, robotics, and safety mechanisms, relay modules are versatile components for managing high-voltage and high-current devices in various electronic and electrical setups.

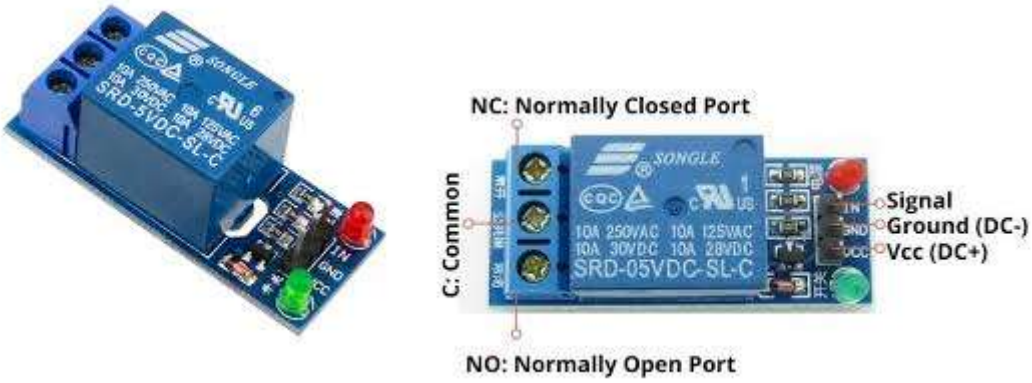

Figure 1.14 Relay Module

This design allows sensitive control circuits, like those in microcontrollers or sensors, to operate devices requiring higher voltage or current without risk of electrical overload

CHAPTER – 2

CLAP ACTIVATED LOCATOR DEVICE

2.1 ABSTRACT

Daily life problems are quite common, including misplacing keys, remotes, or small gadgets. Misplacement of items is something that causes frustration and wastage of time. This device, the CLAP-Activated Locator Device, introduces a new concept using sound-activated technology to find misplaced objects. It consists of a sound sensor, for example, a microphone that catches clapping sounds. Once the sound has been recognized, it creates an alarm mechanism, including a buzzer or an LED attached to the missing item. This will, therefore, provide an easy and direct way for users to locate where their belongings could be. The CLAP-Activated Locator Device has been designed to be compact and affordable as well as being user-friendly, and it doesn't apply to only one type of use case. It can be attached to a wide range of commonly misplaced items, making it the great gadget for making daily life easier. This project demonstrates the real-world problems that sensor technology can solve with its practical application, and an ordinary electronic innovation can radically change life.

2.2 INTRODUCTION

The Clap Activated Locator Device is an innovative and practical solution that can help locate frequently misplaced items, such as TV remotes, keychains, mobile phones, or any small objects that are usually hard to find. Losing everyday items in today's fast-paced world is frustrating and time-consuming. Traditional methods of searching for such objects often require unnecessary efforts, but with the aid of this device, searching becomes simple, efficient, and quick. The device works on the principle of sound recognition technology. This device uses a microphone for detecting a specific sound called a clap and converts the same into an electrical signal. The moment the clap is

identified, the device activates an alert system usually in the form of a sound produced by a speaker to guide the user to the location of the missing object. This design avoids physical searching as it simply allows

the user to clap to prompt the device and then identify the lost item by the sound given out by the device. It is based on simple electronic components that make it easy to construct and cost-effective. It includes a microphone, signal amplifying transistors, capacitors and resistors for conditioning the signal, and an output speaker. The device is powered by a standard 9V battery, making it highly portable and energy-efficient for home or office environments. This is an ideal device for scenarios such as locating a missing TV remote in the living room, finding a keychain in a messy bag or drawer, etc. The Clap Activated Locator Device offers a user-friendly, accessible, and affordable means of dealing with the common problem of losing small, frequently used items. In this simple yet effective design, users can save time and reduce the stress of searching for lost objects.

2.3 COMPONENTS USED

Component	Quantity	Specification
PCB	1	-
Microphone	1	-
Capacitor	1	47 µF
Resistors	4	10 K (2), 1 M (1), 330 Ω (1)
Transistors	2	BC547
Speaker	1	8 Ω
Battery	1	9V
Connecting Wires	As required	-

2.4 CIRCUIT DIAGRAM

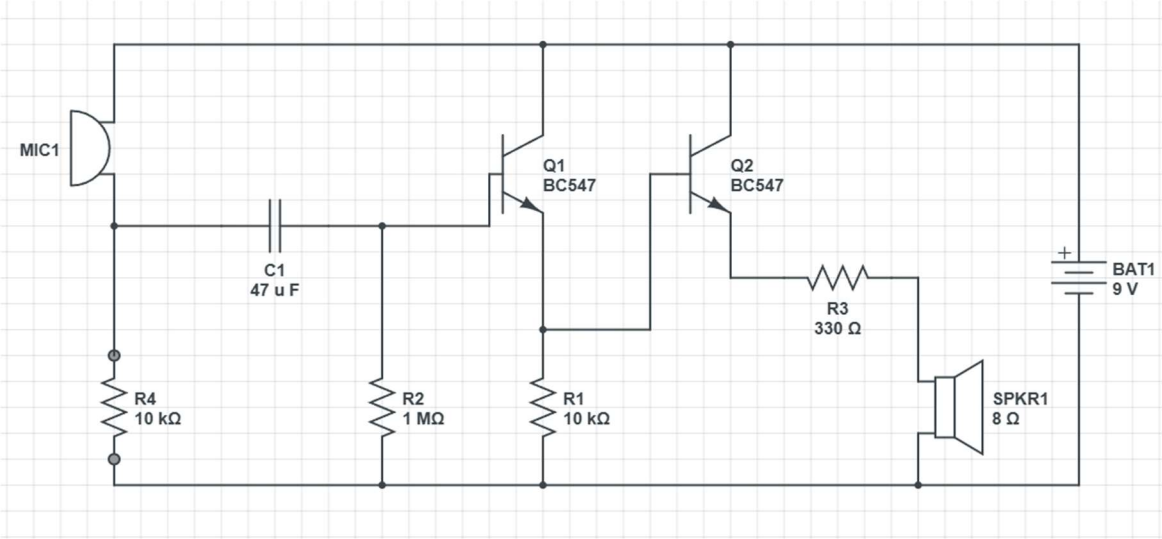

Figure 2.1 Circuit Diagram of Clap Activated Locator Device

2.5 WORKING MODEL

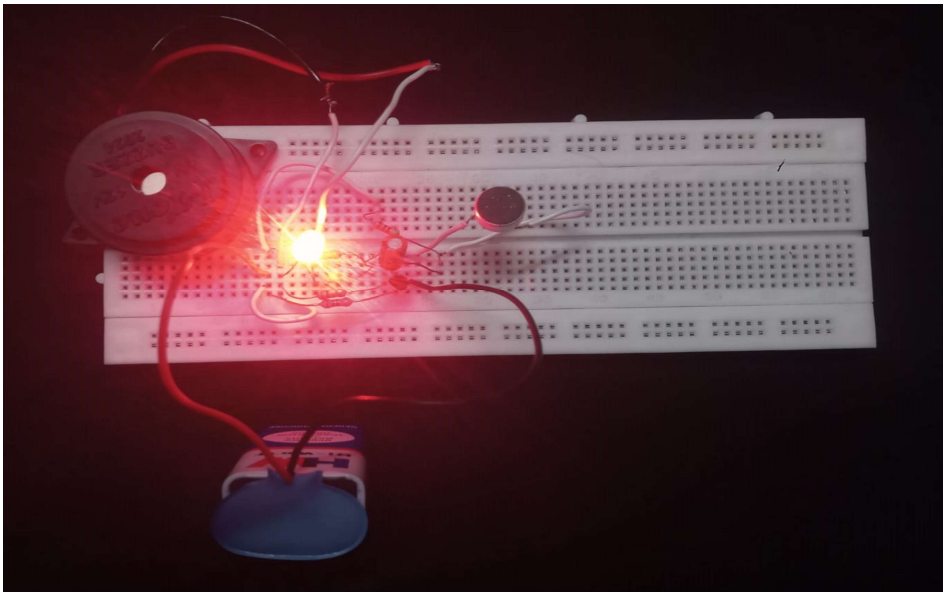

Figure. 2.2 Working model

The Clap Activated Locator Device was designed to assist in searching for frequently misplaced items in the home or workspace. These items can include items such as remote

controls, keychains, or anything small that is easy to lose. The system applies a microphone to detect the specific sound-a clap used as the activation signal in order to activate the locator device. The primary objective of this project is to make finding lost items easier and efficient without having to rely on complex or expensive tracking systems. The device is simple, inexpensive, and straightforward to use. The key component that drives the function of the Clap Activated Locator Device is the microphone (MIC1), which captures sound signals.

The microphone is placed in such a position that it is able to clearly detect claps or other sounds in its environment. When a user claps, the sound waves are caught by the microphone. These sound waves are in the form of vibrations, which are converted into an electrical signal by the microphone. It means that the loudness of the clap would depend on how well the electrical signal was emitted and, hence, how much quality is produced by it. The microphone used for this project is a condenser microphone that is extremely sensitive to the vibrations caused by sound waves. This signal, however, is too weak to drive the rest of the circuit and thus needs amplification and processing. The weak electrical signal generated by the microphone is sent to the first stage of amplification using transistor Q1 (BC547). The role of this transistor is to amplify the small electrical signal received from the microphone so that it can be further processed.

The transistor works by amplifying a small input current into a larger output current, which increases the strength of the signal. The signal is then transferred to the second transistor, Q2 (BC547). This transistor amplifies the signal further or acts as a switch to trigger the output stage. Q2 will regulate the flowing current to SPKR1 producing the sound that guides the finder locate the misplaced object. The process through the second transistor provides only the processed and amplified signal, thus eliminating an erroneous trigger on the speakers. For proper operation, a few resistors along with some capacitors regulate the signal to filter its noise content and also act to regulate the flow of currents. The capacitor, C1, is an important part that filters the input signal, knocking off high-frequency

noise that arises from background sounds or interferences. This means that this circuit will only process the desirable clap sound and not take in any other loud sound. Without the capacitor, the circuit might react to any loud noise, which may not necessarily be the clap. The resistors (R1, R2, R3, R4) set proper bias levels for the transistors and control the flow of current through the circuit. R1 and R4 (10 kΩ) resistors set the bias point for the transistors so that they work correctly. The 1 MΩ resistor R2 is used to regulate the base current of the first transistor, and R3 with a value of 330 Ω limits the current flowing to the speaker. Without these resistors, the transistors may malfunction or even damage other components. When the sound is detected, amplified, and processed, the circuit triggers the SPKR1 speaker that beeps or makes the sound. The sound emitted by the speaker acts as an alert, guiding the user to the location of the lost item. This could be a TV remote, keychain, or any other small object equipped with the device. The beep emitted by the speaker provides auditory feedback, allowing the user to locate the object even if it's out of sight. The circuit is powered by the 9V battery (BAT1). The battery is a major source of power supply to the entire circuit, hence the components are guaranteed proper working. The circuit is energy-efficient, meaning that the battery lasts longer and will not need replacement in the near future.

The entire system was powered by a 9V battery which is relatively convenient and portable power source. The circuit connected with the battery provided the necessary electric power for all of its components, such as the microphone, transistors, and speaker. Since the system does not require a high amount of power, the 9V battery is ideal because it ensures the system is portable and can be easily used in any environment. Once the system is powered up and the user claps, the sound is detected by the microphone, which then triggers the transistors to amplify the signal. After the signal being processed, it emits a noise by the speaker to alert which area the thing is misplaced. Again, the user can move towards the desired item whenever he or she hears such noise emitted from the device. This mechanism is set every time if a sound of clap falls into a range of receiver. Through this device, the individual can easily identify the object which is missing in its respective

place from the home to office. It is well-suited for things such as TV remotes, keychains, mobile phones, and other small things that often go missing. The system is simple, cost-effective, and needs minimal intervention by the user, hence making it an excellent example of how daily technology can be applied to common problems.

2.6 BLOCK DIAGRAM

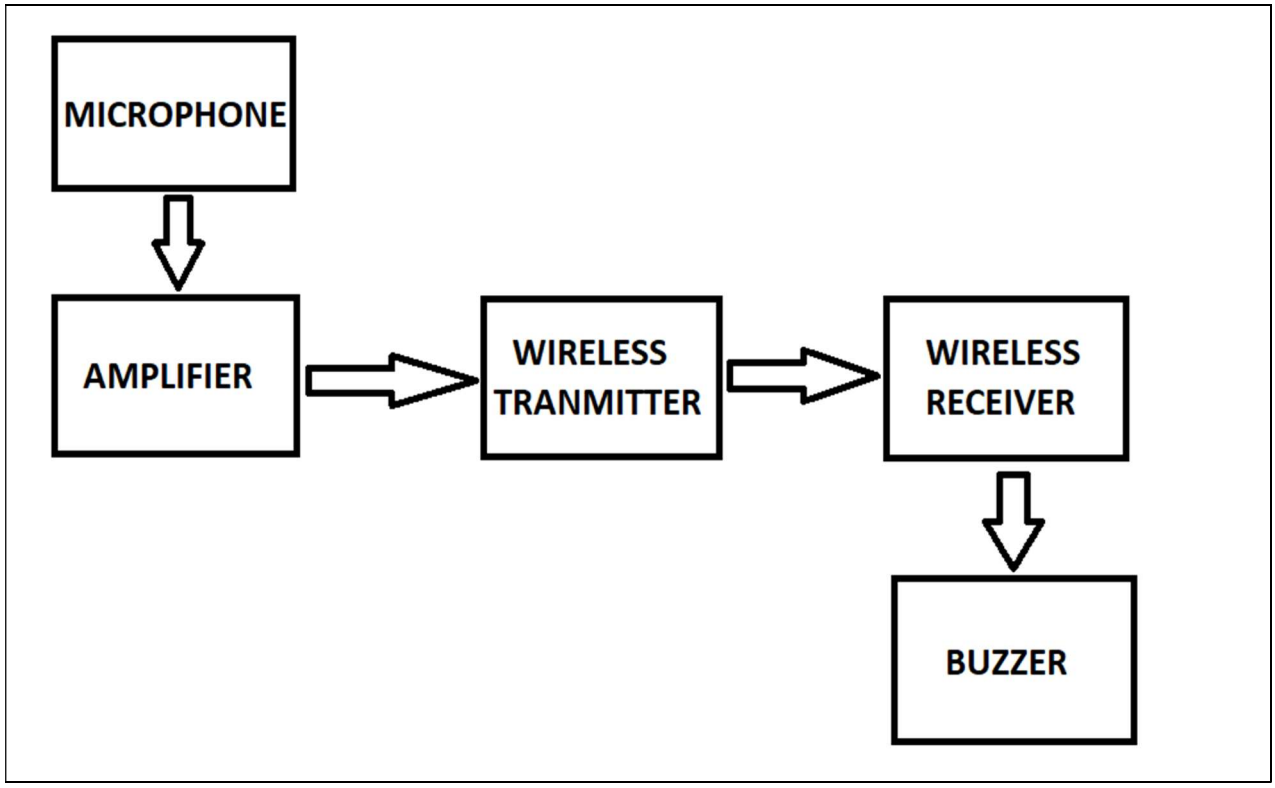

Figure 2.3 Block Diagram

Microphone

- **Working:**
  The microphone catches the sound waves of claps and converts them into electrical signals. The microphone is sensitive to specific frequencies and amplitudes, making it sure that it catches clap sounds.
- **Role in Project:**
  It acts as the major input device for detecting claps.

Signal Processing Circuit

- **Working**:
  It filters the electrical signal coming from the microphone to separate out sounds like claps. It makes use of components such as capacitors, resistors, and operational amplifiers to amplify and filter the input signal.
- **Role in Project:**
  It ensures that the system only responds to clap sounds and not noise.

Buzzer

- **Working:**
  The buzzer makes a sound audible to the human ear whenever activated by the microcontroller. Inside the buzzer is a piezoelectric element that vibrates to produce sound waves.
- **Role in Project:**
  It emits a sound that will help locate the lost item.

LED

- **Working:**
  The light is emitted when the current flows through it, showing the location visually.
- **Role in Project:**
  An extra visual cue for locating the object.

Power Supply

- **Working:**
  It gives the required voltage and current to power all the components in the system. Batteries or a DC power source are typically used.

- **Role in Project:**

  Ensures uninterrupted operation of the device.

2.7 ADVANTAGES:

- User-Friendly and Convenient
- Cost-Effective Solution
- Portable and Lightweight
- Energy Efficient
- Quick and Accurate Locating
- Customizable for Multiple Applications
- No Need for Complex Technology
- Silent in the Absence of Noise
- Helps to Reduce Stress
- Innovative and Fun

2.8 APPLICATIONS

- Finding TV Remotes
- Locating Keychains
- Finding Glasses
- Locating Mobile Phones
- Tracking Wallets or Purses
- Locating Remote-Controlled Devices
- Finding Flashlights
- Helping the Elderly
- In Office Environments
- Home Automation Systems

CHAPTER – 3

ANTI SLEEP ALARM GLASSES

3.1 ABSTRACT:

Driver fatigue is a significant cause of road accidents, often leading to severe injuries or fatalities. The Anti-Sleep Alarm Glasses aim to mitigate this risk by detecting signs of drowsiness and alerting the user in real-time. This innovative device integrates advanced sensors and algorithms to monitor the driver's blinking patterns, eye movement, or head tilt, which are indicative of sleepiness. The system consists of smart glasses equipped with infrared sensors and a microcontroller unit. These sensors detect prolonged eyelid closures or irregular blinking rates, triggering an auditory or vibrational alarm to alert the driver. The lightweight and ergonomic design of the glasses ensures comfort for extended use, making it a practical solution for long-distance drivers, shift workers, and others prone to fatigue.

This project also explores the use of machine learning to enhance drowsiness detection accuracy, adapting to individual driver behaviour. By preventing accidents caused by driver fatigue, the Anti-Sleep Alarm Glasses have the potential to save lives and significantly improve road safety. This report outlines the design, implementation, and testing of the device, along with its real-world applicability and future enhancements. The increasing number of road accidents caused by drowsy driving has raised a significant concern about driver safety. "Anti-Sleep Alarm Glasses" are a wearable solution designed to prevent accidents due to driver fatigue by detecting signs of drowsiness and providing timely alerts.

The glasses utilize sensors to monitor the user's eye movements, blinking patterns, and head posture. When signs of drowsiness or micro-sleep are detected, the glasses issue an audible or vibrational alert, prompting the driver to stay awake or take necessary breaks.

3.2 INTRODUCTION:

Road safety is one of the major concerns across the globe, and one of the major causes of road accidents is driver fatigue. Long hours of driving on monotonous routes and lack of rest lead to a reduction in alertness, thus impairing a driver's ability to respond to road conditions. Global road safety statistics indicate that the number of fatalities due to accidents caused by fatigue is significant and occurs annually. This has been addressed by developing innovative technologies such as Anti-Sleep Alarm Glasses, which can serve as an early warning system to prevent accidents caused by drowsy driving.

This device utilizes cutting-edge sensors and algorithms that can detect early warning signs of driver fatigue, like extended eyelid closures, low blinking rates, or head tilting. Anti-Sleep Alarm Glasses are designed with comfort and practicality in mind, which would make them ideal for long-distance drivers, night shift workers, and other professions with high risks of sleepiness. The glasses immediately activate an alarm, either auditory or vibrational, upon detecting signs of drowsiness to alert the user and prevent them from dozing off. This project report explores the design, implementation, and working principles of Anti-Sleep Alarm Glasses. It also discusses the potential impact of this technology on improving road safety and saving lives, along with insights into its limitations and scope for future enhancements.

These glasses represent a great leap forward toward reducing accidents and ensuring safer roads by addressing the critical challenge of driver fatigue. In addition to its primary application in preventing road accidents, the device has broader implications for industries requiring sustained alertness, such as aviation, logistics, and healthcare.

With a focus on portability, affordability, and ease of use, these glasses are not just a technological advancement but a step forward in creating safer, more secure environments for individuals and communities alike.

3.3 COMPONENTS USED:

Component	Quantity	Specification
Transparent Glasses	1	-
Relay Module	1	-
Buzzer	1	-
Battery	1	9V
Cutting Female Jumping Wire	As required	-
Male-Female Jumper Wire	As required	-
IR Sensor	1	-

3.4 CIRCUIT DIAGRAM:

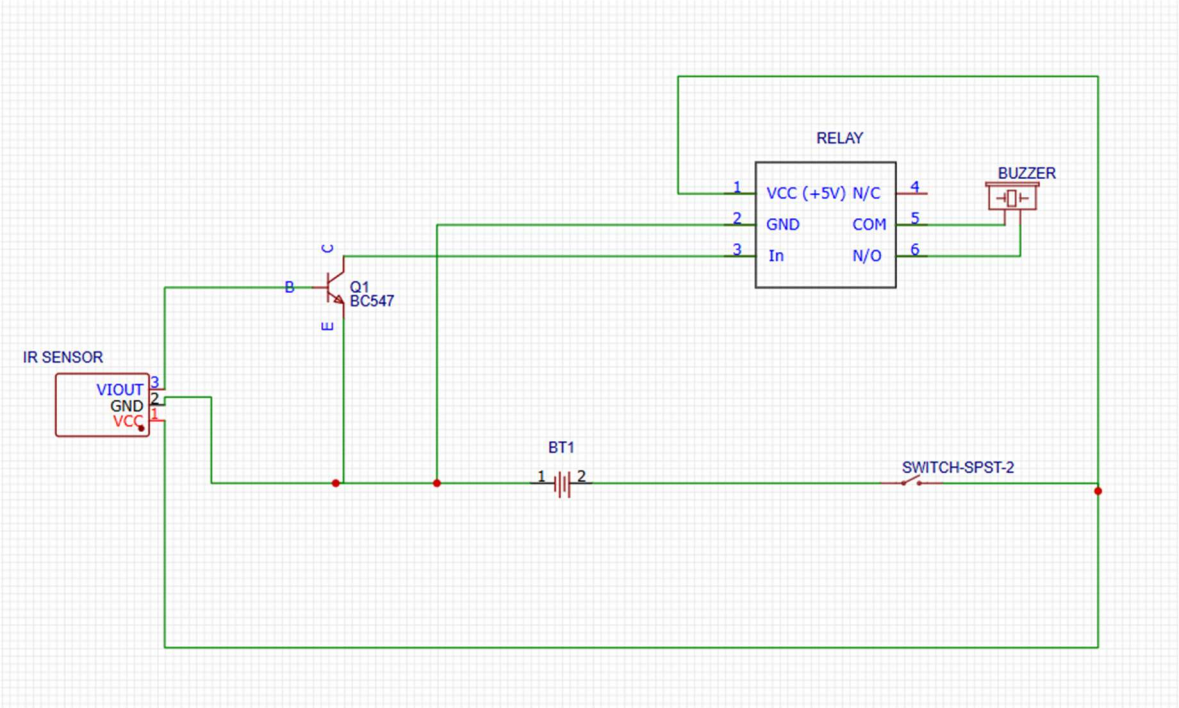

Figure 3.4 Circuit Diagram of Anti Sleep Alarm Glasses

3.5 WORKING MODEL:

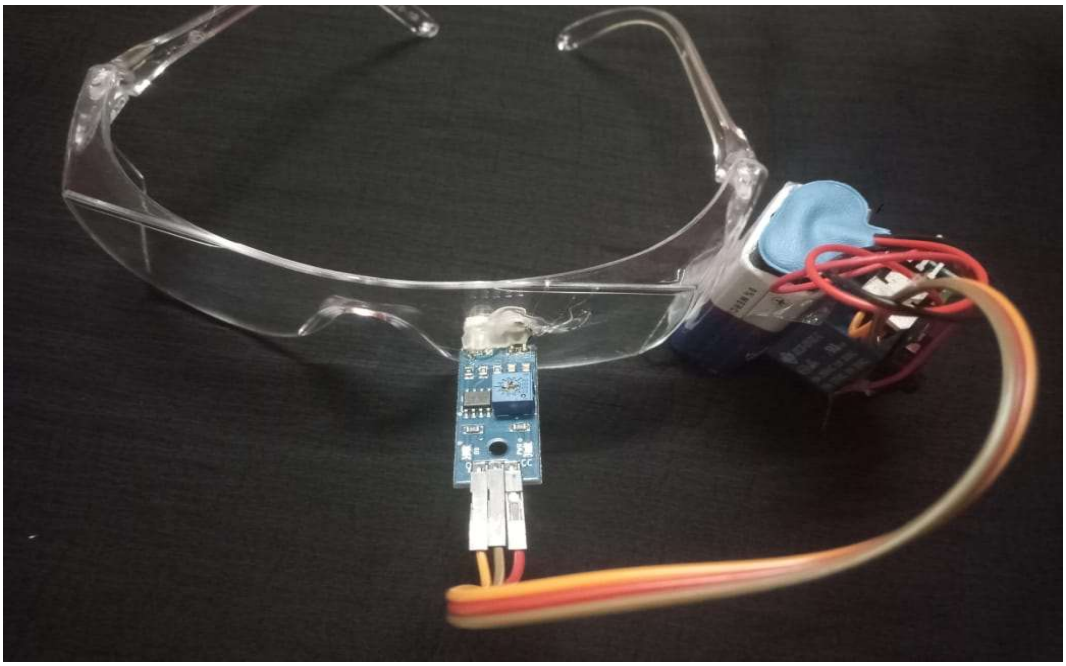

Figure 3.5 Working Model

The Anti-Sleep Alarm Glasses project is an innovative solution to this problem, especially for individuals who have to stay awake during certain activities such as driving or during long work hours. It uses a 9V battery that supplies energy to the primary components: an infrared sensor, relay module, transistor, buzzer, and a switch. These are integrated into a pair of glasses, making the device portable and easy to use. The IR sensor is a very important component that detects drowsiness signs. The sensor is mounted on the glasses and constantly emits infrared light, monitoring the reflections from the eyes of the user. If the eyes are open, the sensor captures the normal reflection pattern. But if the eyes remain closed for a long time, which is a sign of drowsiness, the reflection pattern changes, and the sensor captures this change. The change gives rise to a signal at the sensor, which is then transmitted to the next circuit stage. The signal from the IR sensor is relatively weak and requires amplification to activate the relay module. That's where the transistor comes in. The transistor is essentially a switch that amplifies the output signal from the sensor to

a level that will activate the relay. Upon receiving the amplified signal, the relay module closes the circuit and allows current to flow to the buzzer. The relay module is an essential part because it permits the low-power signal from the IR sensor and transistor to actuate a higher-power device such as the buzzer. Once the relay is on, it completes the circuit from the power supply to the buzzer, and an alarm starts to sound in the buzzer. The sound produced by the buzzer is so loud that anyone can listen to it for alerting the person for drowsiness and then wake them up.

The system has a switch that provides the user with manual control over the device. The switch will turn on or off the alarm system so that it is used only when necessary. A user may turn the device on during the beginning of an activity, such as driving, where high concentration is needed, and turn it off after the task is done or after reaching a safe place. This project, being an effective and inexpensive accident prevention tool due to fatigue, has a compact and lightweight design, with the components well integrated into glasses, making it practical for everyday use. As it uses basic electronic components such as an IR sensor, transistor, relay, and buzzer, this device is affordable and very easy to build. The Anti-Sleep Alarm Glasses are an innovative way to combat drowsiness and improve safety for individuals who need to remain alert for extended periods with its real-time alerting system.

The Anti-Sleep Alarm Glasses operate using a simple yet effective mechanism. A 9V battery powers all components, ensuring portability and reliability. The IR sensor, mounted on the glasses, constantly emits infrared light to monitor the reflection patterns from the user's eyes. When the eyes are open, the reflection remains consistent, and no alarm is triggered. However, if the eyes stay closed for a prolonged period, indicating drowsiness, the reflection changes, and the sensor generates a weak signal.

This weak signal is then amplified by a transistor, which ensures it is strong enough to activate the relay module. The relay acts as a switch, completing the circuit and allowing current to flow to the buzzer. Once activated, the buzzer produces a loud alarm, alerting

the user to their drowsy state. A manual switch is also provided, enabling users to turn the device on or off as needed.

This compact, lightweight, and cost-effective system ensures real-time detection of drowsiness, making it a practical tool for enhancing safety during activities that require high alertness.

3.6 BLOCK DIAGRAM

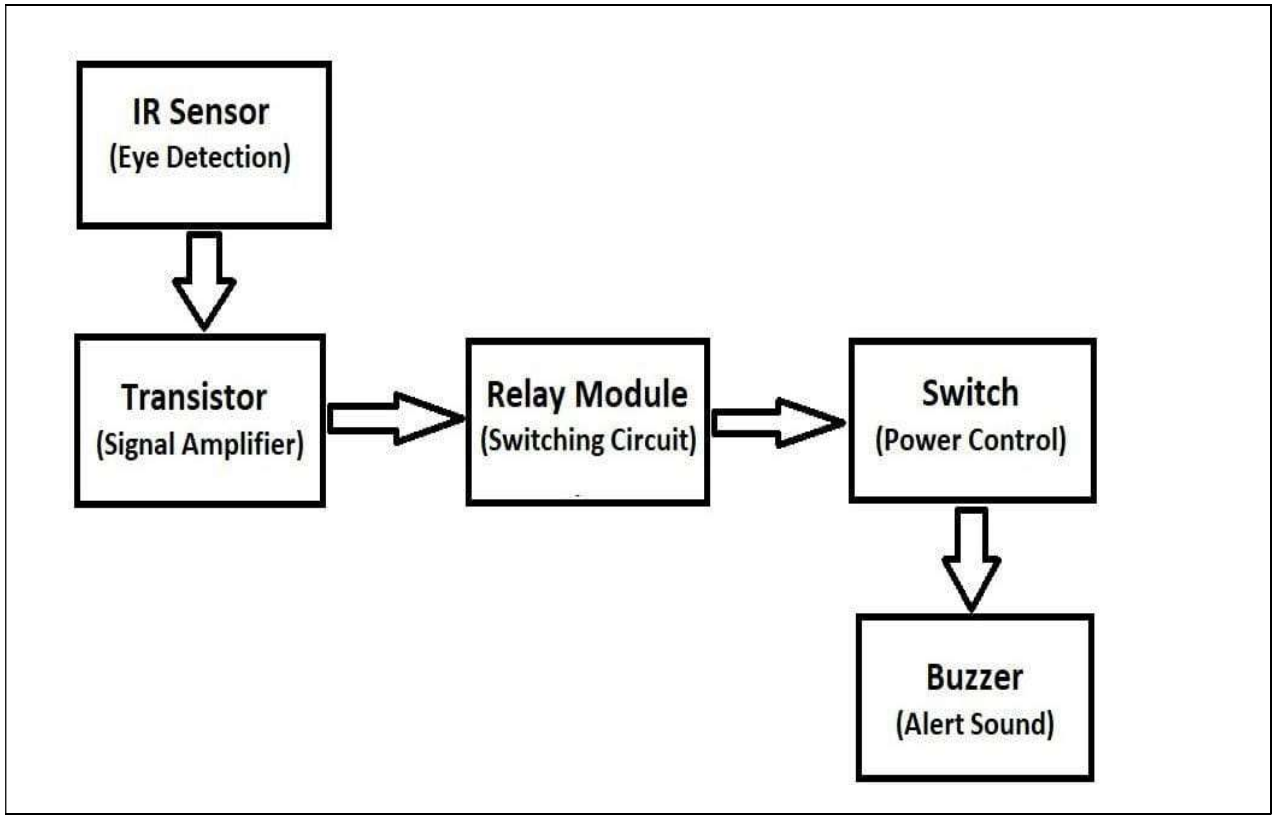

Figure 3.6 Block Diagram

IR Sensor:

- Connect the IR sensor close to the glasses frame to detect eye blinks.
- The sensor provides a HIGH signal when it finds the eyes are closed more than normal.

Transistor Driver:

- Connect the output of the IR sensor to the base of a BC547 transistor using a 1kΩ resistor.
- The emitter is grounded, and the collector connects to the relay module.

Relay Module:

- The relay activates the buzzer or vibration motor when it is triggered by the transistor.
- The relay coil derives its power from the 9V battery.

Buzzer/Vibration Motor:

- Connect the positive terminal of the buzzer or vibration motor to the NO (Normally Open) terminal of the relay.
- Connect the other terminal of the buzzer or motor to the negative terminal of the battery.

Power Supply:

- The circuit is completely powered by the 9V battery.
- Use a toggle switch for the power supply

3.7 ADVANTAGES:

- Enhanced Road Safety
- Comfort and Convenience
- Multi-Modal Alerts
- Cost-Effectiveness
- Versatility
- Energy Efficiency
- Scalability and Upgradability
- Potential Life-Saving Impact

3.8 APPLICATIONS:

- Road Safety
- Workplace Safety
- Education and Office Work
- Healthcare
- Aviation and Maritime
- Military
- Emergency Response
- Everyday Life
- Smart Integration

CHAPTER 4

CONCLUSION

CLAP-Activated Locator Device: This is a simple, low-cost, and user-friendly solution for the widespread problem of losing small items like remotes and keychains. By using claps to activate the device with the help of sound, this product does not require any additional tool such as smartphones or a wireless communication module for activation, thus making it accessible to everyone. The components involved are the microphone, signal processing circuit, microcontroller, and buzzer, which provide reliability in the performance and easy usage of the device. This project, besides showing the potential application of sound recognition technology in practical life, also offers the benefits of cost and ease: it can be used as a product in daily needs. Potentials for future improvement include better noise filtering and auxiliary locating mechanisms (like LEDs or vibration).

The Anti-Sleep Alarm Glasses are a significant step forward in safety technology, addressing the dangers of drowsiness, especially in high-risk environments like driving, industrial work, and healthcare. The glasses integrate sensors to monitor eye activity and head movements and alert systems such as buzzers and vibration motors, which can be used proactively to prevent accidents due to fatigue. It is compact, ergonomic, and energy efficient; therefore, it could be used for long-term use without having to sacrifice comfort or functionality. It also has applicability across many sectors such as road safety, workplace safety, and emergency response, hence a wide scope of its potential impact. With advancement in technology, the further enhancement would be Bluetooth connectivity, machine learning, and integration with smart systems that can make Anti-Sleep Alarm Glasses even more personalized and effective. In the end, it not only provides a lifesaving intervention but also renews the awareness of the critical need for alertness and focus in various daily tasks.

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