



Anti-Sleep Alarm System

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Abstract

In the modern era, where students juggle academic responsibilities, extracurricular activities, and social engagements, the traditional alarm clock often falls short in effectively waking them up. This paper presents "Rise & Shine," a novel anti-alarm system designed specifically for students. Departing from conventional loud sounds that induce stress, frustrate, grogginess, Rise & Shine employs a multifaceted approach to awaken users gently and efficiently. By integrating customizable wake-up messages, physical activity incentives, gradual light simulation, and gamification elements, the system aims to transform the morning routine into an engaging and uplifting experience. Additionally, social accountability features, smart alarm detection technology, and personalized sleep analysis further enhance the effectiveness of Rise & Shine in promoting healthy sleep habits and ensuring timely awakening. Through its innovative design and user-centric features, Rise & Shine represents a promising solution to the pervasive issue of oversleeping among students, fostering a productive and energized start to each day. It recognizes the multifaceted nature of the modern student's life, acknowledging the delicate balance between academic commitments, extracurricular activities, and social engagements. By offering customizable wake-up messages tailored to individual preferences, users are greeted with encouraging words or motivational quotes, setting a positive tone for the day ahead. Departing from the jarring sounds of conventional alarms, this innovative system gently guides users into wakefulness through a series of carefully curated features.

Index Terms - Work Flow, Circuit Details, Working.

I. INTRODUCTION:

The anti-sleep driving alarm for people doing all night drives as well as security guards and others we have to sit in one place for long periods of time without any stimulating interaction. The newest high tech way to stay awake is a good purchase for you whether you ever have to drive back home after an exhausting day at work or just need to get something done and sleep is not an option. This trusty sleep alarm will keep you at full alert and is always ready to help if your head dozes off. This has the potential to save lives on the road. Long distance lorry drivers can fall asleep by driving too long hours due to the pressures put on them to get the goods to their destination at certain times. This item has the potential to keep them awake or at least to tell them when they are over tired and need to stop driving.

All-night Drivers: accidents due to drivers falling asleep at the wheel are quite common. Maybe a long and tiring day at the office has drained your energy and all you want to do is return home and sleep. Some drivers tend not to pay attention on long stretches of a boring road they know too well and without knowing it they doze off. Protect yourself and your passengers with this anti sleep alarm.

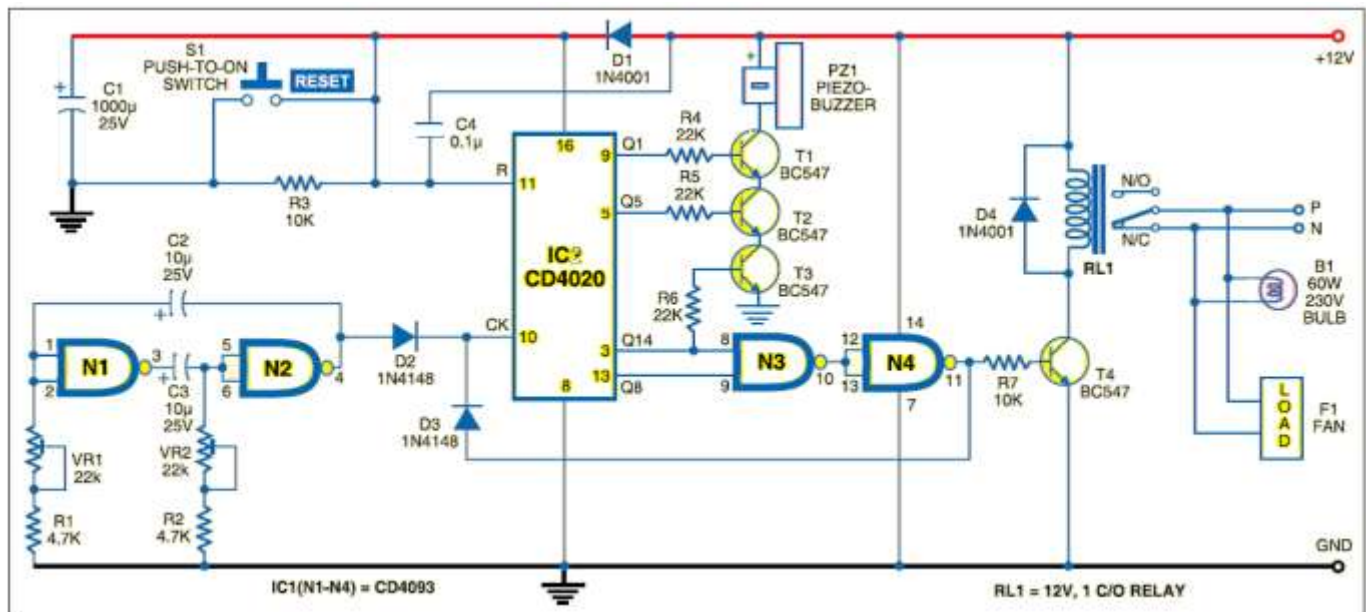
Security Guards: This anti sleep alarm will make sure your eyes are kept wide open and on the target. Its ergonomic design ensures comfort during prolonged wear, while adjustable sensitivity levels cater to individual preferences and environments.

Students: Maybe they forgot the exam was tomorrow, maybe they were out partying, or maybe they just waited until the last minute. In any case, college students always have the need to burn the midnight oil. The problem is that it is extremely easy to fall asleep in the midst of studying and before you know it, morning has come and the exam is already over or you still haven't learned the material. If you don't want that to happen, then keep this reliable anti sleep alarm at your side.

By investing in this anti-sleep alarm, you're not just safeguarding yourself – you're contributing to safer roads and communities. With its ability to prevent fatigue-related accidents, this device is more than just a purchase; it's a commitment to your well-being and the well-being of those around you. Stay vigilant, stay alert, and stay alive with this indispensable safety accessory. Designed with user comfort in mind, this alarm boasts a compact and ergonomic build, allowing for extended wear without discomfort. Its adjustable sensitivity levels cater to individual needs, whether you're embarking on a long-haul journey or keeping watch over a property throughout the night. Gone are the days of relying on caffeine or loud music to stay awake – this alarm provides a non-invasive solution that gently prompts you to remain alert, averting potential accidents before they occur.

II. CIRCUIT DIAGRAM :

This circuit saves both time and electricity for students. It helps to prevent them from dozing off while studying, by sounding a beep at a fixed time interval, say, 30 minutes. If the student is awake during the beep, he can reset the circuit to beep in the next 30 minutes. If the timer is not reset during this time, it means the student is in deep sleep or not in the room, and the circuit switches off the light and fan in the room, thus preventing the wastage of electricity.



III. WORKING :

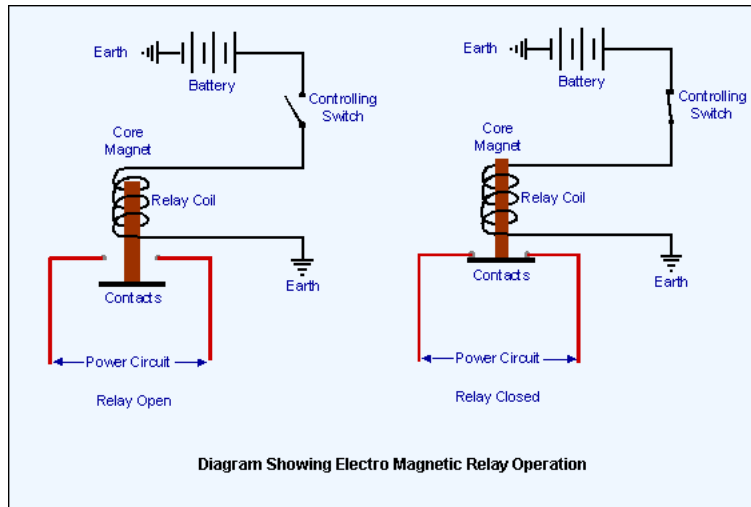
The project operates by continuously monitoring the driver's eye movements using an eye detection sensor, which could be an infrared sensor or a camera. This sensor analyzes patterns of eye movements, including blink frequency and duration, to assess the driver's level of alertness. By comparing these patterns with predefined criteria for drowsiness, the system identifies signs such as prolonged eye closures or irregular blinking patterns, indicating drowsiness. Upon detecting drowsiness, the system generates alerts to notify the driver, typically through visual cues like dashboard warning lights or auditory cues like alarms. Simultaneously, the system may automatically reduce the vehicle's speed to a safe level and activate warning signals, such as hazard lights, to alert other motorists. Continuous monitoring ensures timely feedback and alerts to keep the driver alert and attentive. If the driver fails to respond to initial alerts or if drowsiness persists, the system may initiate further interventions, such as emergency braking or contacting emergency services. Once the driver becomes alert again or drowsiness is no longer detected, the system deactivates alerts and returns to monitoring mode, ready to respond to any future signs of drowsiness.

Components of Anti-Sleep Alarm System:

1. Relay
2. Bulb
3. Transistor or SCR
4. Push to ON/OFF Switches
5. Resistor and Capacitor
6. Piezo buzzer
7. Diode
8. IC: IC CD4020
9. IC: IC CD4093
10. Printed Circuit Board

The circuit is built around Schmitt trigger NAND gate IC CD4093 (IC1), timer IC CD4020 (IC2), transistors BC547, relay RL1 and buzzer. The Schmitt-trigger NAND gate (IC1) is configured as an astable multi vibrator to generate clock for the timer (IC2). The time period can be calculated as $T=1.38 \times R \times C$. If $R=R1+VR1=15$ kilo-ohms and $C=C2=10 \mu F$, you'll get 'T' as 0.21 second. Timer IC CD4020 (IC2) is a 14-stage ripple counter.

Around half an hour after the reset of IC1, transistors T1, T2 and T3 drive the buzzer to sound an intermediate beep. If IC2 is not reset through S1 at that time, around one minute later the output of gate N4 goes high and transistor T4 conducts. As the output of gate N4 is connected to the clock input (pin 10) of IC2 through diode D3, further counting stops and relay RL1 energizes to deactivate all the appliances. This state changes only when IC1 is reset by pressing switch S1. Assemble the circuit on a general purpose PCB and enclose it in a suitable cabinet. Mount switch S1 and the buzzer on the front panel and the relay at the back side of the box. Place the 12V battery in the cabinet for powering the circuit. In place of the battery, you can also use a 12V DC adaptor.



1. Relay: A relay is an electrically operated switch. Many relays use an electromagnet to operate a switching mechanism mechanically, but other operating principles are also used. Relays are used where it is necessary to control a circuit by a low-power signal (with complete electrical isolation between control and controlled circuits), or where several circuits must be controlled by one signal. The first relays were used in long distance telegraph circuits, repeating the signal coming in from one circuit and re-transmitting it to another.

2. Transistor: A transistor is a semiconductor device used to amplify and switch electronic signals. It is made of a solid piece of semiconductor material, with at least three terminals for connection to an external circuit. A voltage or current applied to one pair of the transistor's terminals changes the current flowing through another pair of terminals. Because the controlled (output) power can be much more than the controlling (input) power, the transistor provides amplification of a signal. Today, some transistors are packaged individually, but many more are found embedded in integrated circuits.

3. Diode: A modern semiconductor diode is made of a crystal of semiconductor like silicon that has impurities added to it to create a region on one side that contains negative charge carriers (electrons), called n-type semiconductor, and a region on the other side that contains positive charge carriers (holes), called p-type semiconductor. The diode's terminals are attached to each of these regions. The boundary within the crystal between these two regions, called a PN junction, is where the action of the diode takes place. The crystal conducts conventional current in a direction from the p-type side (called the anode) to the n-type side (called the cathode), but not in the opposite direction.

4. Switch: It is an electrical component that can break an electrical circuit, interrupting the current or diverting it from one conductor to another. The most familiar form of switch is a manually operated electromechanical device with one or more sets of electrical contacts. Each set of contacts can be in one of two states: either 'closed' meaning the contacts are touching and electricity can flow between them, or 'open', meaning the contacts are separated and non-conducting. This is called a PTM or "Push to Make" switch.

5. Arduino Nano: It is a Micro controller board. It is used for technical support, where we dump a code into it and it works as a Controller or a Function. The operating Voltage of 5v, however the input Voltage can vary from 7 to 12v.

6. Piezo Buzzer: The piezo buzzer produces sound based on reverse of the piezoelectric effect. The generation of pressure variation or strain by the application of electric potential across a piezoelectric material is the underlying principle. These buzzers can be used alert a user of an event corresponding to a switching action, counter signal or sensor input. They are also used in alarm circuits.

7. IR Sensor: It is a electronic device used to detect some objects near-by surroundings. It detects the movement of an object. In this project we used IR Sensor as an input to detect the moment of eye-blink.

IV. APPLICATIONS:

It saves electricity when student is not in his room or he fall asleep. While these alarms work to help keep drivers awake, some high-end manufacturers are adding sleep sensors to their cars right at the factory. A few notable systems:

1. Mercedes-Benz Attention Assist uses the car's engine control unit to monitor changes in steering and other driving habits and alerts the driver accordingly.
2. Lexus placed a camera in the dashboard that tracks the driver's face, rather than the vehicle's behavior, and alerts the driver if his or her movements seem to indicate sleep.
3. Volvo's Driver Alert Control is a lane-departure system that monitors and corrects the vehicle's position on the road, then alerts the driver if it detects any drifting between lanes.
4. Saab uses two cameras in the cockpit to monitor the driver's eye movement and alerts the driver with a text message in the dash, followed by a stern audio message if he or she still seems sleepy.

V. RESULT:

The anti-sleep driving alarm, a groundbreaking solution designed to combat fatigue and keep you alert during extended periods of monotony or sedentary activities. Whether you're a long-distance truck driver navigating endless highways or a dedicated security guard keeping watch through the night, this high-tech device is your trusted companion for staying awake and focused when it matters most. Engineered with state-of-the-art sensors, this alarm detects even the subtlest signs of drowsiness, providing timely alerts to prevent potential accidents. Its ergonomic design ensures comfort during prolonged wear, while adjustable sensitivity levels cater to individual preferences and environments. No longer do you need to rely on stimulants like caffeine or distracting music to stay awake – this alarm offers a discreet and effective solution that gently nudges you back to alertness.

VII. CONCLUSIONS:

In conclusion, the concept of an anti-alarm system for students represents a transformative approach to waking up that prioritizes effectiveness, personalization, and holistic well-being. Throughout this exploration, we've uncovered a range of innovative features and future trends that promise to revolutionize wake-up routines for students. From customizable wake-up messages to AI-powered adaptive algorithms, from seamless smart home integration to immersive AR and VR experiences, the future of anti-alarm systems holds boundless potential. These systems will not only wake students up on time but also do so in a way that minimizes stress, maximizes alertness, and promotes overall wellness.

Moreover, the evolution of anti-alarm systems extends beyond mere wake-up functionalities to encompass broader aspects of students' lives. By integrating features for stress reduction, mental well-being, and productivity enhancement, anti-alarm systems become indispensable tools for supporting students in their academic and personal endeavors. As we look ahead, it's clear that anti-alarm systems will continue to play a pivotal role in shaping the future of morning routines. By embracing emerging technologies and prioritizing user-centric design, these systems have the potential to empower students to start their day on a positive note, setting the stage for success and well-being. In essence, the journey towards the future of anti-alarm systems is one of innovation, collaboration, and continuous improvement. By harnessing the power of technology to enhance the wake-up experience, we can create a brighter, more energized future for students everywhere.

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