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Automatic Baby Cradle

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ABSTRACT

The objective of this proposed system is to develop a new low cost indigenous electronic cradle because existing cradle are imported and very costly. The proposed systems aim is to build a low cost new automatic baby cradle that will be swings automatic when the baby cries or uncomfortable in the cradle, for this when the cries the voice sensing system detects the baby cries voice and swings the cradle automatically till the baby stop crying and the speed is control as per the need. The messaging system to send message to the mothers mobile or the nurse in the hospital when the baby cries more than a stipulated time indicating that baby needs attention. This proposed system will help to the mothers or nurse to take care of babies without physical attention and also save the time of mothers and the nurse in hospitals.

Keywords: Arduino UNO, cradle, Motors, audio sensor, PIR sensor.

I. INTRODUCTION

Parents in the present world are busy in their professional life, so they do not get sufficient time to take care of their babies. It may be expensive for the parents to afford a nanny. Today's woman has to manage home along with their office work simultaneously. After long working hours, they have to take care of the home along with the baby. They may not get enough time to swing the cradle manually and sooth the baby. The system is designed to help parents and nurses in infants care. The design aims at following point: Cradle starts swinging automatically when baby cry and swings till the baby stops crying.

II. PROPOSED WORK

Steven Bang designed automatic baby rocker having a noise sensor to detect baby cry. Noise sensor consists of Electret MIC with a pre amplifier (2n3904 transistor). Signal from noise sensor is fed to microcontroller Arduino ATmega 328, which is used to control the DC motor. Few color full lights made up of LED are used to entertain the baby while being rocked. RE-260RADCmotor with Tamie a 6 speed gearbox is used to create the rocking motion the crib[1].

Yang Hu proposed an algorithm for adjusting the bassinet swaying extent by the sensor signals. The bassinet is made up of an adaptive swaying device and other sensors network. While baby is crying, the sensors network can judge the reason according to detecting parameters, giving the different signals to control circuit. At the

same time, the bassinet starts to sway lightly. The swaying rhythm can be adjusted according to parameters from baby status.They used three pressure sensor located in the bassinet bottom, one at the centre and others at left and right of the bottom.[2].

Marie R. Harper invented a crib adapted to be rocked automatically. Once the crib is manually tilted in one direction and released, this permits the inertia to actuate the locking and actuating arms to operate under the biasing force of spring in conjunction with the gear. Thus spring loaded motor begin to operate and the lever arm is oscillated in back and forth movement. This provides the same effect as would be achieved by the mother rocking the crib containing the baby. Oscillation of crib is stopped when the slightest resistance is incurred [3].

Gim Wong presented an Electronic device that can be attached to conventional pivotally mounted type crib. This is actuated by baby cry voice picked up by the microphone giving short throw type rocking action to crib. Very similar to a person rocking the crib by pushing and pulling on the foot or head board. There is a sensitivity control so that baby voice only actuate the rocking action and a timer to controlled the duration of rocking action [4].

Chau-Kai-Hsieh proposed a baby cry recognizer which includes an amplifier circuit for amplifying a received sound signal. In response to the amplified sound signal, a pulse generator circuit generates a pulse signal having zero crossings which are aligned with zero crossings of the amplified sound signal. The pulse signal, in turn, is inputted to a signal recognition circuit. The signal recognition circuit outputs a signal indicating that a baby's cry was detected [5].

III.BACK GROUND OF PROBLEM/HISTORY

The problem statement for building an automatic baby cradle is to provide a safe, convenient, and comfortable environment for infants to sleep in. Parents often struggle with getting their babies to sleep and may find it difficult to soothe them when they wake up in the middle of the night. Additionally, parents may have other responsibilities or tasks to attend to and mayoral ways be able to provide the constant attention and care that infants require.

An automatic baby cradle can help address these challenges by providing a consistent and soothing motion that can help babies fall asleep and stay a sleep. It can also provide a safe and secure environment for infants to sleep in, reducing the risk of Sudden Infant Death Syndrome (SIDS) and other sleep-related accident. Furthermore, an automatic baby cradle can allow parents to attend to other tasks or take a break while still providing a comforting presence for their baby. Overall, the problem statement for building an automatic baby cradle is to provide a solution that promotes in fat sleeps a feat, convenience, and comfort for both the baby and the parents.

IV.NEED OF PROPOSED SYSTEM

1) **Scope:** The scope of a project for an automatic baby cradle would typically involve designing and building a cradle that can automatically rock a baby to sleep. The cradle could be designed with various features, such as adjustable speed and motion, music or white noise, and a timer to turn off the rocking motion after a set period of time.The proposed system would involve a range of tasks, including researching and selecting appropriate materials and components, designing and prototyping the cradle, programming and

testing the automation system, and ensuring that the cradle meets safety standards for baby products.Other considerations in the scope of the project might include designing the cradle to be easily assembled and disassembled, developing a user manual or instructional video to guide assembly and use, and exploring options for manufacturing and distribution.The scope of a proposed system would involve a combination of engineering, design, and manufacturing expertise, as well as a focus on safety and usability for parents and babies alike.

2) **Benefits:** The benefits of our proposed system are listed asthree main aspects:

- Providing valuable free time for new parents.
- Reducing stress on baby with instant notification and care.
- User-friendly to the baby

3) **Materials:**

- Arduino uno
- Sound sensor
- PIR sensor
- DC Square motor
- Cradle(model

4) **Objectives:**

The Objective of the project is to develop a new low cost indigenous:

- Electronic cradle which works on the principle of automatic system.
- To design the development of an intelligent baby care, which ability to monitor baby voice and swings automatically.
- To make cradle innovation that is more flexible and less expensive to market the corresponding number, in square brackets.

V. BLOCK DIAGRAM OF PROPOSED SYSTEM

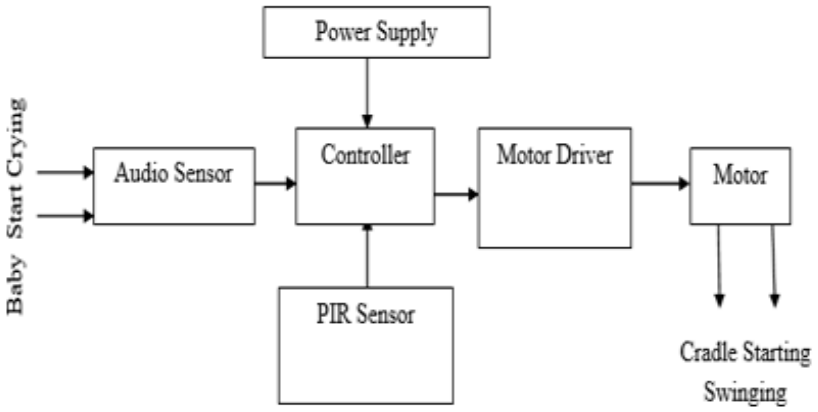

Figure 1: Block diagram of E-Baby Cradle

VI. COMPONENT DESCRIPTION

1) Arduino UNO:Arduino UNO is a microcontroller board based on the ATmega328P.It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16S MHz ceramic resonator, a USB connection, a power jack, an ICSP header and a reset button.Analog Pin A 0 is connected to voice sensor. Digital Pin 08 is connected to PIR sensor. When the Digital Signal to the controller the next circuitry will start, then the analog signal will read by the controller. And the signal is given to them motor driver to rotate the motor.
2) Voice Sensor:A sound sensor is a simple, easy-to-use, and low-cost device that is used to detect sound waves traveling through the air also measure its intensity convert it to an electrical signal which we can read through a microcontroller. The VCC pin is connected to the VCC of the Arduino UNO and GND pin is connected to the GND pin of the Arduino UNO. The OUT pin is connected to the analog pin A0 of the Arduino UNO When the voice is detected by the sensor, the analogy OUT will be high and output will be given to the Arduino UNO.
3) PIR Sensor:A passive infrared sensor (PIR sensor) is an electronic sensor that measures infrared (IR)light radiating from objects in its field of view. They are most often used in PIR-based motion detectors. The VCC pin common for all components in the circuit. The OUT pin connected to the digital D8 pin of the Arduino UNO. When the motion is sensed by the sensor OUT pin will high and Arduino UNO will to get digital signal.
4) Motor Driver:A motor driver is an electronic circuit or module that is used to control the speed, direction, and/or torque of a motor. Motor drivers are commonly used with DC motors, stepper motors, and servo motors. The motor driver takes the signal from Arduino UNO and it will pass to motor.
5) DC square motor:A DC motor is an electromechanical device that converts electrical energy into mechanical energy.The motor is connected to the motor driver, when the driver gets the signal the motor will rotate in180degree.

A. Flowchart

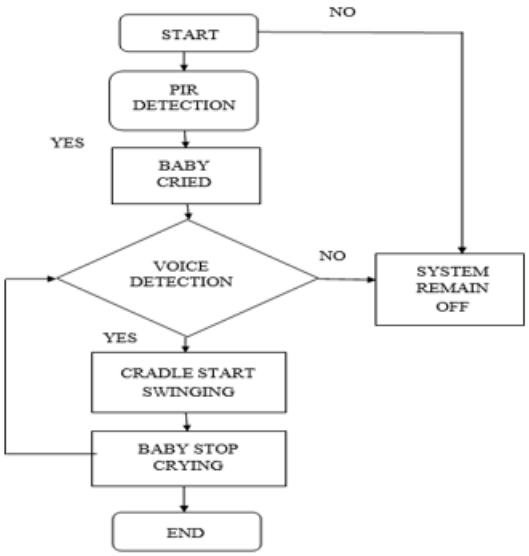

Figure2:Flowchart of E-Baby Cradle

VII. ADVANTAGES

- Nursery: Automatic baby cradles are ideal for use in the nursery, providing a safe and comfortable sleeping space for infants.
- Living room: An automatic baby cradle can be placed in the living room, allowing care givers to keep an eye on the baby while they are working or relaxing.
- Daycare centers: Automatic baby cradles can be used in day care centers to provide as a fe and comfortable place for infants to rest.
- Hospitals: Automatic baby cradles can be used in hospitals to provide a soothing and calming environment for newborns, especially those in the neonatal intensive care unit (NICU).
- Special needs facilities: Automatic baby cradles can be used in special needs facilities to provide a comfortable and safe sleeping space for infants with special needs.

VIII. RESULTS

The result of an automatic baby cradle project should be a functional and safe device that can automatically rock a baby to sleep. The cradle should be designed with the safety of the baby in mind, with features such as a sturdy and stable frame, a secure harness or restraint system, and mechanisms to prevent the cradle from tipping over or malfunctioning.

The automatic rocking mechanism should be designed to mimic the natural motion of a parent's arms, with a gentle back-and-forth motion that can soon the and calm a fussy baby. The speed and intensity of the rocking motion should be adjustable to accommodate different preferences and needs.

The device should also be easy to operate and maintain, with clear instructions and a user-friendly interface.

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