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AUTOMATIC SMART BABY CRADDLE

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ABSTRACT

This project is aimed at developing an interactive "AUTOMATIC SMART CRADLE SYSTEM". During the early stages, infants need proper rest and sleep for growth and development. Hence, it is the responsibility of the parents/guardian to provide the necessary care and attention to the infant. But with the modern lifestyle, parents are busy and have a lot of work with little time to provide for their little ones. In today's world we see that most of the families consist of mainly the parents and children.

When a baby is born in a family there has to be someone to look after the baby. Some parents have to do a double task of keeping a check on the baby as well as do the household work. Parents in the present world is busy in their work so they do not get sufficient time to take care of their babies.

Today's woman has to manage home along with their office work simultaneously. So, to help such parents we have decided to come up with a smart cradle which will help a mother or a father have a track of their child and do some household work simultaneously. This project can be used to detect the infant's cry and swing the cradle automatically and also send the alert message to their parents or caretaker and the sensor used in the project will continuously keep on checking whether the baby's mattress is wet or not and send the notification to parent mobile using blynk app.

Keywords: Wet Sensor, Sound sensor, servo motor, Arduino uno, nodemcu esp8266, blynk app

1. INTRODUCTION

As far as time and security is concern with the help of IOT we will build a cradle system which will make parents stress free and most important it will be safe and secure for the baby. So, managing the work in time and taking care of baby is very important factors. In the digital world of modern parents, duty of caring new born baby mostly on women which plays role of hurdle and also question marked on secureness, health, comfort, etc. of baby. So, for these people who belief in technology for them we are proposing automated cradle system which will connected to the parent's mobile for sending alert message. Sound sensor will be attached to cradle in such a way that it will take input sound of baby only, it will conclude the activity to be performed as per the range of sound in decibels, if the sound is more than certain amount then system will automatically start swinging the cradle, if baby still not sleepy or stop cry alert will send to the parents. Wet sensor is used for check that has baby done pee? If any kind of wetness is detected it will send the alert message to the parents. This cradle system will decrease the difficulty of these hurdle, and release the stress of parent and the most importantly baby will safe, healthier and he will sleep without any discomfort. Cradle system will give parents required time to parent for rest, as if the parents both mother and father goes for the job or even if the mother is house wife. Being stress free will definitely create the great atmosphere which will make great atmosphere around the baby. So, it doesn't matter if there is no one to swing cradle it will do swing automatically if the baby is crying. It doesn't matter if baby has done pee and no one knows about for long time, but not need to worry cradle system will also give the alert about the wetness in cradle. This cradle system will help the parents, so that they can take good care of their baby. The modules in cradle system from which any one will be operated after any kind of situation that are given as follows: If the baby is making noise or baby is crying then sound sensor will hear that frequency and it will start swing. Also, alert message will send to parent through the blynk app. If the baby had wetted the matrices of the cradle, then alert message will send to parent through the blynk app.

1.1 PROBLEM STATEMENT

One of the biggest wealth an infant could get from their parent's is their love and care. It can never be replaced by any other factor. But that precious person goes through tough time when looking after her infant especially when the baby's age is less than 1. She sacrifices everything including her health to look after her beloved child. As health is a cycle, when the mother's health gets affected, it influences the infant's health too due to mother feeding. Mother's health needs to be protected. Here comes the smart cradle to help her. Some infant monitoring system was developed to notify the parents during alarm conditions. But this cradle system is developed to notify the one or the other activity of the baby. It is implemented to help the parents who were busy in office work. In our proposed cradle system can sense the wet

conditions of the baby's bed and it also detects the crying sound. Initially, data is collected from the sensors and it is monitored with subjected values. Finally, alert messages sent to parent mobile phones during abnormal conditions. The measured various parameters of sensors were displayed on the mobile phone. The cradle will start swinging by using the servo motor when the crying sound gets detected by the sensor.

2. LITERATURE SURVEY

In the paper [1] that has been referred, "Smart baby cradle" an IOT based cradle management system was published in 2018.In this paper author had given features like PCB for sensing wet conditions, Cradle swing which has a side-to-side rocking motion that eases the baby and put it to sleep via geared motor mechanism, also with some additional features such as watching the baby live through Arduino camera. Use of various sensors such as PIR (passive infrared) sensor to detect light level inside the cradle, etc. The Smart Baby Cradle allows them to monitoring their babies, the cradle, play soothing music, observing the temperature of the infant, bed wet sensor which will caution the attendants for bunk wetting of the infant. [August 17, 2017 IOP Conf. Ser.: Mater. Sci. Eng. 226 012095] In the paper [2] that has been referred, "Development of an Intelligent Cradle for Home and Hospital Use" published in 2015. In this research paper author states that system is designed monitor baby movement, bed-wet condition and body temperature. PIR sensor detects the movement of infant. After the location of enlivening of infant various occasions are terminated which incorporate sending notices to mother by SMS. And also observes the temperature of the infant to give therapeutic thoughtfulness regarding the child and cautions the folks if the body temperature of the child goes above to given threshold temperature. The cradle additionally incorporates a wet sensor which will caution the folks or the attendants for bunk wetting of the infant. It will help to keep the infant in a hygienic environment. System was giving three modules that was obviously good point. But there was absence of one important module of swinging cradle automatically. [January 20, 2020 ISSN 2393-8021 ISSN 2394-1588] In the paper [3] that has been referred, "An Automatic Monitoring and Swing the Baby Cradle for Infant Care" published in 2015. In this research paper author states that swing mechanism has been provided to the cradle and by reading facial expression system was trying to determine whether baby is safe or not. Here the cradle that swings automatically when baby cries, for this it has a cry analysing system which detects the baby cry voice and accordingly the cradle swings till the baby stops crying. The system has inbuilt alarm that indicates two conditions – first when the mattress is wet, which is an important parameter to keep the baby in hygienic condition, second when baby does not stop crying with in a stipulated time, which intimated that baby needs attention. Here a video camera is positioned above the infant's cradle which captures video. So, because use of Artificial intelligence cost of system got increased. [May 17, 2020 e-ISSN: 2395-0056 p-ISSN: 2395-0072]

In the paper [4] that has been referred, "IOT Based Smart Cradle System for Baby Monitoring" published in 2019. In this research paper author had given a features like Motion sensor that is PIR sensor will detect the motion it is used for security purpose and in point of view of any danger, there will be two temperature sensors used that are DHT11 and LM35, DHT 11 will check the temperature of whole room and LM 35 sensor will measure temperature of the body of baby. Sound sensor will be attached to cradle if the sound is more than certain amount then system will automatically start swinging the cradle. Wet sensor is used for checking the wetness of the bed and so on. [January, 2021 Journal of Robotics and Control Volume 2, Issue 1 ISSN: 2715-5072]

3. PROPOSED SYSTEM

Many of IOT devices are being develop in the IT sector. There are some cradles also, which are built with integration of IOT, but still there are some less feature which could be threat to the health of the babies. As we have seen in India or any other industrializing nation that both parents need to go to work and also look after the baby which increases workload on both the parent, it could also affect their professional life and their babies' life. Due to less featured cradle systems and parents busy schedule we are implementing modern day cradle system.

3.1 BLOCK DIAGRAM

A block diagram is a diagram of a system in which the principal parts or functions are represented by blocks connected by lines that show the relationships of the blocks. The above block diagrams shows the complete working of the smart cradle system. The system consists various hardware part like Arduino, Sound sensor, Wet Sensor, nodemcu esp8266 WIFI module, and Servo motor. The individual devices and sensors were assembled and is observed to be working efficiently. Arduino Uno is the heart of the system. Arduino Uno controls the whole system. When the baby is awake from the sleep, initially the cradle swings automatically with the help of the servo motor respectively. This may help the baby to stop crying and go back to sleep once again. But in case the baby does not stop crying, the situation is notified to the parent. Also, the system checks the wetness of the bed. If there is a change then wet sensor corresponding action will be carried out. If the wetness is detected, the blynk notifies the parent.

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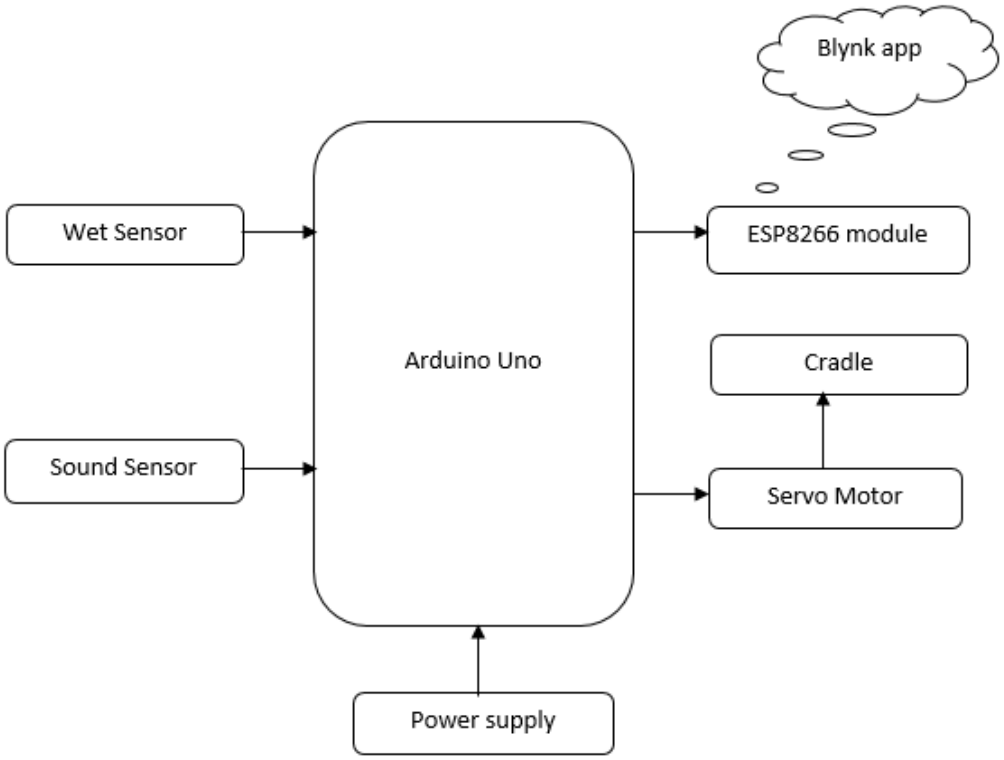

Fig. 1

The above block diagram depicts the complete working of the smart cradle system. When the child is made to sleep on the cradle various sensors like sound detection sensor, wet sensor and servo motor is implemented to monitor the various actions of the child The above diagram shows the automatic working of the cradle. When the sound of the baby cry is detected the system checks whether the sound level is above the threshold value set initially. If the sound is above the mentioned threshold value a signal is sent to the servo motor for the automatic swing and if the baby is crying a notification is sent to the blynk application that the baby is crying. When the baby is sleeping the sound will be less than the threshold value and if the wet sensor senses any kind of wetness in the bed then a notification is sent to the blynk application.

3.2 CIRCUIT DIAGRAM

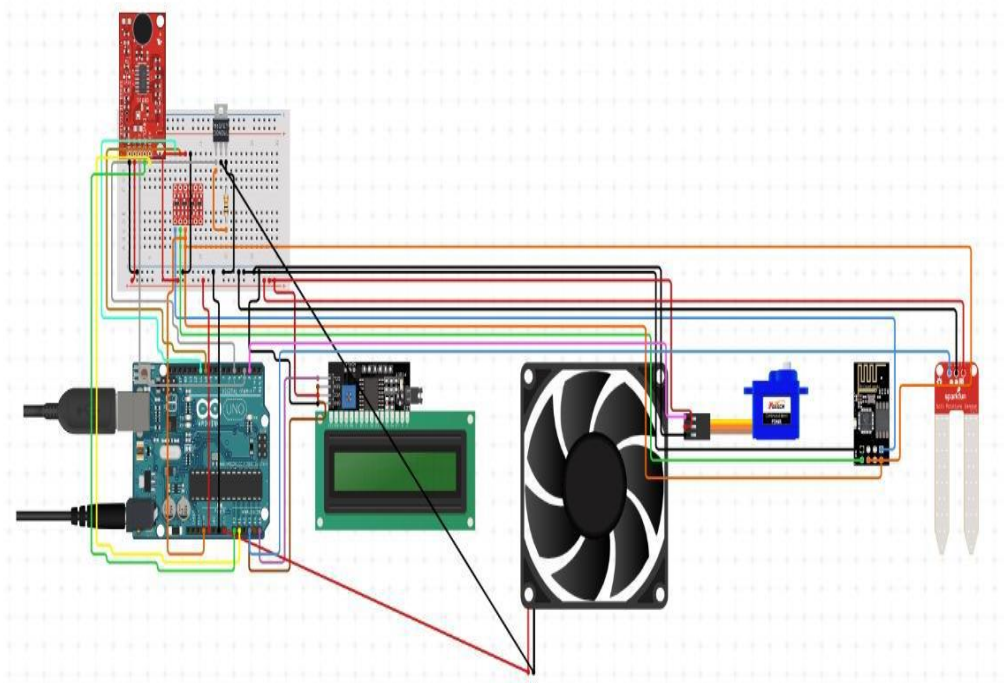

Fig .2

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4. EXPECTED RESULT

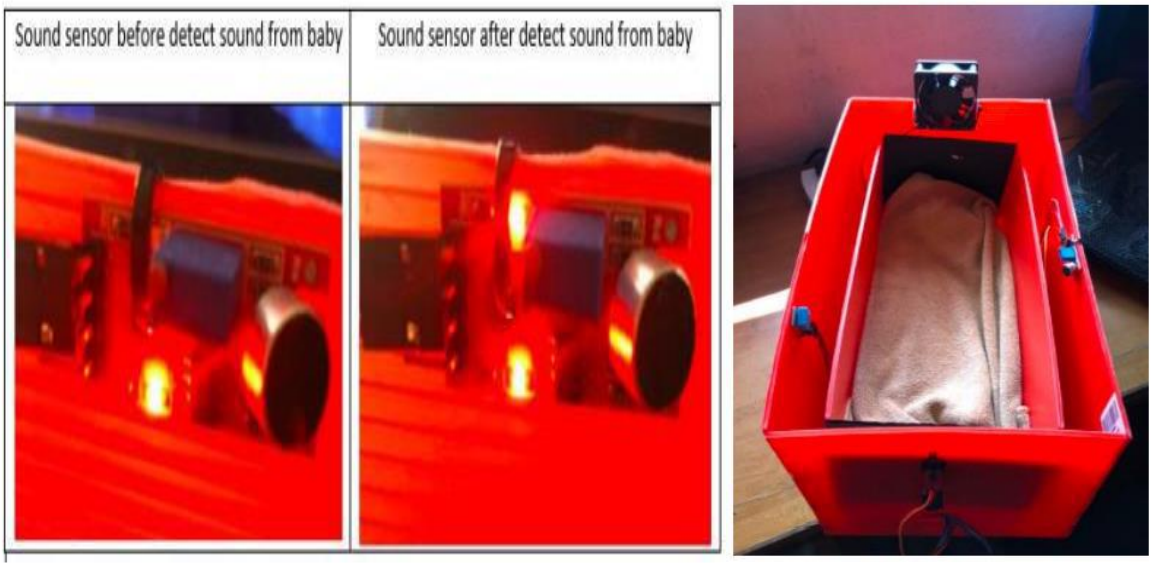

Fig.3

5. CONCLUSIONS

The growth of technology has been increased rapidly and its contribution to the society can be done in various way. The most precious treasure for a parent is their child. Although the days with little kids often seem long, the years fly by. So, they opt to spend excess of money for the ease and nourishment of their baby. Finding the right child care is a big deal and it's no wonder -is there anything more important for them.

This Smart Cradle System assures them that their baby is safe and secure inside the cradle. Cradle which is less expensive and more secure and have more features. As health of small baby is always factor for which parents are always worried. So that cradle system is built for that purpose that baby will be healthier.

This smart cradle would let the working parents to do their works besides taking care of baby at the same time. When the baby cries, then system will automatically start swinging the cradle and parents are intimated by sending message and if any kind of wetness is detected then alert message will also be sent to the parents. This designed product will be reliable, easy to maintain, safe and less in cost compared to other types of automatic electronic cradle and will be available in an affordable price.

6. REFRENCES

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