



Research Paper

## DESIGN, FABRICATION AND ANALYSIS OF AUTOMATED CRADLE

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This paper presents a new approach in designing an automatic swinging cradle system. This system helps the parents and nurses in taking care of their infant without physical attention. It has inbuilt wet sensor which alarm if the baby wets which intimated that baby needs attention. This system can be mainly used in hospitals, crèches and at home.

**Keywords:** Swinging, Wet sensor, Bassinet

### INTRODUCTION

In the present scenario where both the parents are busy in their professional life, it has become very difficult for them to get sufficient time to take care of their babies. Sometimes it is not affordable for them to afford a nanny. This result in admitting their child to crèche during their job timing. It is found that most of the times baby stops crying or sleeps when they are in cradle. In today's life style, it is very difficult for parents and nanny to sit nearby their child and sooth them whenever they cry or sleep. Thus, we have designed a system which would help the parents in the child care without physical attention. Automatic cradle is a device that provides an aid to swing the baby cradle automatically.

This system aims at two main things in assisting parents.

Automatic cradle movement.

Inform parents when necessary.

### LITERATURE REVIEW

Steven Bang invented automatic baby rocker having a noise sensor to detect baby cry. Noise sensor consists of Electric MIC with a pre amplifier. Signal from noise sensor is fed to microcontroller which is used to control the DC motor. Few colourful lights made up of LED are used to entertain the baby while being rocked.

Yang Hu suggested 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 slightly.

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Marie R. Harper designed a crib adapted to be swung 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, the spring loaded motor begin to operate and the lever which is attached to crib is oscillated in back and forth movement.

Gim Wong introduced an Electronic device that can be attached to conventional pivotally mounted type crib. Which is actuated by baby cry voice picked up by the microphone giving short throw type rocking action to crib

Chau-Kai-Hsieh introduced 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.

Misha Goyal and Dilip Kumar introduced a automatic baby cradle which includes an microphone to detect baby cry and to it convert into electric signal, op-amp which used as amplifier for signal conditioning circuit and a microcontroller to receive the amplified signal and to convert the amplified signal to digital signal. Microcontroller controls the drive circuit that starts a motor and sways the baby bassinet according to the input signal.

Anritha Ebenezer and Anupreethi. S proposed an automatic swinging system having a microphone to detect the baby cry and which converts the sound signal to electrical signals which are then amplified by the amplifier and then sent to peak detector

where cry peaks detected and further sent to microcontroller. Microcontroller controls the signals to be sent, then the output of which is sent to drivers which drives the Dc motor and makes the cradle to swing according to sound intensity.

## COMPONENTS

Bassinet (750 \* 440 \* 310 )

Motor (200RPM , Torque - 45kg-cm)

Microcontroller

Wet sensor

Frame (870 \* 600 \* 870)

Free Wheel (Outer Diameter - 100mm, Thickness 22mm)

Curve Plate - (Width - 22mm, Thickness- 5mm, Diameter - 290mm)

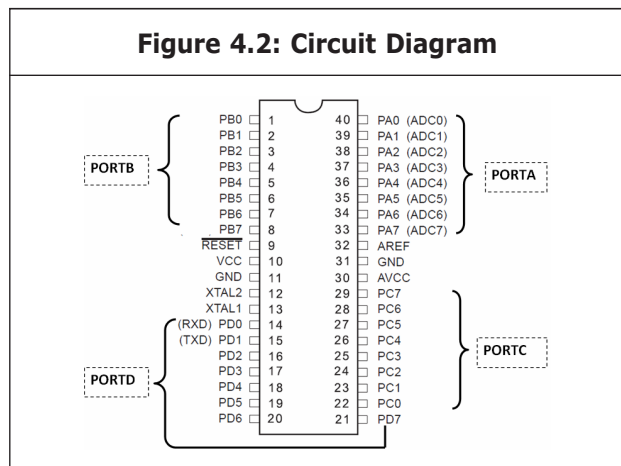
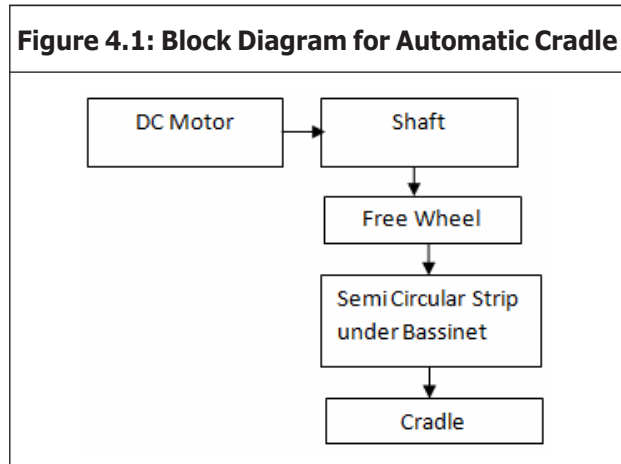
## WORKING PRINCIPLE

DC motor will provide rotational motion according to its rated power. The shaft of DC motor is connected to main shaft on which the free wheel is mounted. The curve plate mounted below the bassinet is made in contact with the free wheel by means of rubber lining as a friction material. As per microcontroller programming the motor rotates in clockwise direction for 3 seconds and then in anticlockwise direction for 3 second.

When the motor rotates in clockwise direction it pushes the bassinet as the free wheel mounted on shaft is in contact with the semi circular strip under the bassinet and after 3 second the motor will rotate in anticlockwise direction and due to this the bassinet will be pushed on the either side and in this way the system will keep working.

## BLOCK DIAGRAM

DC motor will provid



## DESIGN OF AUTOMATIC CRADLE

The system is design so that baby feels comfortable and gets a good sleep. Mechanical & electronic components are design is such that it provides smooth and gental motion just like parents manually swings the cradle. Also, when cradle stops swinging it does not give jerks to the baby.

## FUTURE SCOPE

In this system level sensor can be used by considering baby safety, If baby goes above a specific level the system will inform parents about it. Moreover, camera can also be

provided to keep watch on baby live. Remote control can be given to ON and OFF the cradle,

**Figure 5.1: Front View of Automatic Cradle**



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## CONCLUSION

Thus, the above designed system would be of great use to the working parents and nurses for taking care of their infants. This system emphasizes the importance of child care which is our society future.

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