

MODELING & FABRICATION OF E-BABY CRADLE SYSTEM

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ABSTRACT: Cradle is an appliance which uses to carry a baby and oscillate automatically with certain speed for comfort sleep of a baby. Baby's sleeps sound in mosses baskets or cradle, as they afford a limited sleeping atmosphere which helps them feel secure. E-Baby Cradle is a concept, which enables the movements of a carriage, to raise the cradle, automatic movement of cradle when baby is disturbed and much more. The equipment E- Baby cradle includes a 12V DC motor, links, and an oscillating bed and sensors. The electric powered motor will actuate the links by shaft. Links actuates the rod attached to the bed at constant speed. It will also ensure the cradle motion even when the baby cries or moves using sensors. Motor, link and sensors are attached to the side of the cradle frame. High strength, lightweight material is used for the manufacturing of Cradle. E-Baby cradle is the most cost effective, user friendly, automated mechanism for baby care in the modern•

families. Our project aims at the modeling and fabrication of an Electro Mechanical Cradle for the purpose of using it infamilies with medium income.

INTRODUCTION

In today's world, everyone is busy in its own life. Nowadays, even them others are working and there is a requirement of unattended cradle. The proposed E-Baby Cradle is an ovel solution to thisproblem. In the proposed modeling, there will be a circuit placed along the cradle which will sense the sound intensity of the cry of the child and takes necessary actions based on the sound intensity of the child's cry.

The system is designed to help parents and nurses in infants care. The design aims at following points:

Cradle starts swinging automatically when

baby cry.

- If the baby stops crying before 2 minutes, then the cradle will stop automatically after 3 minutes of swinging.

And on the bulb when mattress gets wet. Before the use of cradle in society, baby caring was completely by caretaker but in the nuclear family baby. Before the use of cradle in society, baby caring was completely by caretaker but in the middle family baby caring is very difficult. So there is a need for automation in the cradle section. As the baby needs more care and safety automation of cradle is very much difficult for safe design. Cost is much important to develop a cradle with an automated mechanism. The family faces the problem of carrying the baby to places for that cradle must be mobile. So the standard living of the reputed family needs the automated cradle. Various small industries use components made of plastic, rubber etc., assembled mechanically to make simple cradle but when using automation we need material with strength and for simple using materials must be weight less. For considering safety of baby sharp edges are covered with rubber. Cradle performance and efficiency is high as it needs less electricity and probability of failure is completely removed. There are a lot of limitations encountered in the use of conventional cradle. Conventional cradle is

not user friendly, has less comfort, more time consuming, and is less safe. The idea of automatic cradle which will overcome the above stated limitations. The design and construction of an automatic cradle ensures comfortable and safe sleep for the baby. It may be used without a necessary external assistance or assistance from a care taker due to the concept of the design. The project is aimed at designing and constructing an electrically powered mechanical cradle for rocking a baby in a carriage with ease and in the most economical way. The cradle is expected to work with minimal technical challenges and greater comfort due to its wide range of application. The device can be used in any height within a range and can be moved from one place to another by castors attached to the frame. This project has a great relevance in the modern nuclear family.

LITERATURE REVIEW

Gim Wong presented 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. 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 actuates the rocking action [1].

have the command on the output we need according to our requirement .so in our project the output is to we have to make a baby cradle which swings automatically without presence of any care taker which is suitable up to babies get 2 years of age from birth .The torque required for oscillating the basinet and the strength of the that can withstand the vibrations was taken into consideration in order to start the design .So initially we had designed the structure of the cradle by drafting on a paper work as shown in fig no 2.1 soon after the drafting was shaped by using a software called CREO.

RESULTS AND DISCUSSIONS

In order to construct any equipment we would

BEARING

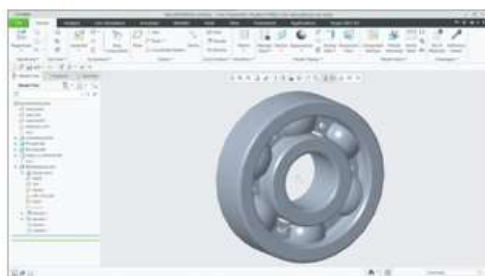


Fig. 3.5.1 Part drawing of Bearing

MOTOR

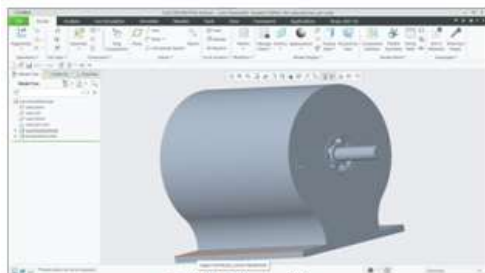


Fig. 3.6.1 Part drawing of Motor

TOP VIEW OF CRADLE

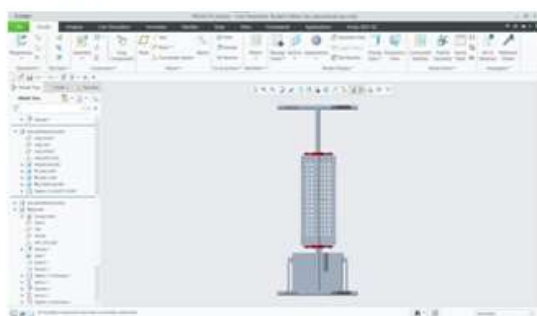


Fig. 3.7.3.1 Top view of the cradle

COMBINATION OF SIDE, FRONT, TOP, AND ISOTROPIC VIEWS:

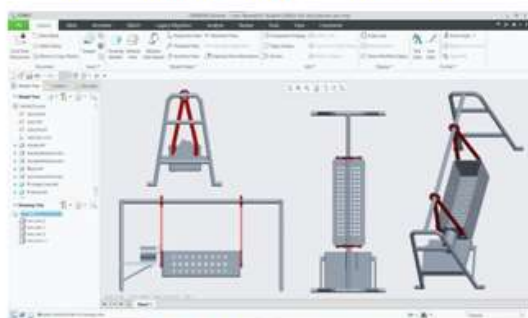


Fig - 3.7.4.1 Different views of the cradle

WORKING PRINCIPLE OF E-BABY CRADLE SYSTEM:

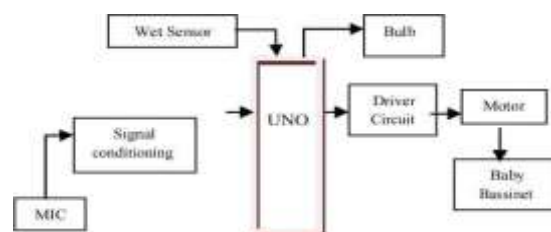
The above diagram depicts the

complete working of the smart cradle system. When the child is made to sleep on the cradle various sensors like noise sensor, moisture sensor, motor driver module ,etc..... The equipment Baby care includes a dc motor, link, and an oscillating bed and sensors. The electric powered motor will actuate the links by shaft. Links actuates the rod attached to the bed at constant speed.

The carriage is attached to the metal rod through links which will provide a oscillating motion. It will also ensure the cradle motion even when the baby cries or moves using sensors. Motor, links and sensors are attached to the side of the cradle frame. When the motor rotates in clockwise direction it pushes the bassinet to front side & when motor rotates in anticlockwise direction it pushes the bassinet on the Either side. And in this way the system will keep working.

Baby Cradle swings automatically when baby cries, for this it has a cry analyzing system which detects the baby cry voice and accordingly the cradle swings till the baby stops crying. The system has inbuilt LED bulb that indicates condition when the baby mattress is wet, which is an important parameter to keep the baby in hygienic condition.

CONCLUSION



In our project we have finally achieved our aim to make a e-baby cradle which reduces the efforts of the parents by the automatic working devices in which the cradle is controlled automatically according to the baby needs. A smart cradle with a baby monitoring system over IoT has been designed and fabricated to monitor a baby's vital parameters, such as crying condition, humidity. Node MCU was used as the main controller board in the project's circuit design, because it had a built-in module, which enabled the implementation of IOT concept in the developed system. The demand of IOT was achieved by using the Node MCU due to its simplicity and open-source nature. Stainless steel and G.I was used as the material to build the baby's cradle, because of its general use and its workability. Improvements were made during the enhancement phases to ensure that the research outcomes achieved the objectives. The finished prototype was tested by using a mobile phone with a baby crying ringtone, which was placed in the cradle. When the mobile phone rang for a few seconds, the cradle started swinging because of the system's assumption that the baby was crying due to the detected sound.

FUTURE SCOPE

This device affords plenty of scope for modification's, further improvements and operational efficiency, which should make it

commercially available and attractive. If taken up for proper production and marketed properly, we are sure it will be accepted by each and everyone for infant care.

- Automatic baby cradle can be used at hospitals.
- Useful to grandparents also for caring babies.
- Convenient & affordable to working parents.
- This mechanism is less power consuming so it is acceptable and affordable.
- It can adopt more features to make more efficient and user-friendly.

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