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Design and Development of Automatic Cradle

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Abstract: Now a days The Automatic Baby Cradle System is reliable and helps in efficient baby monitoring. This system can play a significant role in providing better infant care, and also to monitor parameters such as baby cry and using this information the parents to look after their baby. In case of parents especially those who are busy, doesn't have maid, nursery to look after their baby, the automatic cradle take care as their parents. One of the feature is noiseless working of the cradle and jerk free motion. When the baby starts crying the microphone sensor senses the sound of the various frequencies and then the cradle starts swinging on a low speed and then the cradle start swing for about six minutes and slows down as the frequency of baby reduces. The system architecture consists of sensors for monitoring vital parameters, dc motor for cradle movement, a sound buzzer all controlled by a single Aurdino Mega microcontroller core. The automatic cradle is economical and user friendly. The built in timer in the microcontroller will regulate the operation time, which reduce the time and energy used.
Keywords: Automatic swinging, microprocessor, DC motor

I. INTRODUCTION

Generally, the baby cradle is used for to make baby sleep, we need automatic cradle to take care of child which uses the battery or power source. Besides, there are extra features or function is provided by the newly automatic cradle that is beneficial for parents. Because in the present world people are very busy in their professional life so they do not get ample time to take care of their infants. It will be very difficult control the babies and if someone is hiring professional to take care of their infants. It may increase your expenses from monthly expenditure. Moreover, in today, life it is very hard to even for the homemakers (mummy) to sit nearby their babies and look after them whenever they feel uncomfortable. Though, it is automatic this application is very useful for the nurses in maternity units of hospital. Improving the mechanism of providing the motion to the bassinet, to attain the noiseless working of the cradle and to achieve jerk free motion.

II. PRODUCT DEVELOPMENT PROCESS

This product "DESIGN AND DEVELOPMENT OF AUTOMATIC CRADLE" carried based on KARL .T. ULRICH'S product development process X
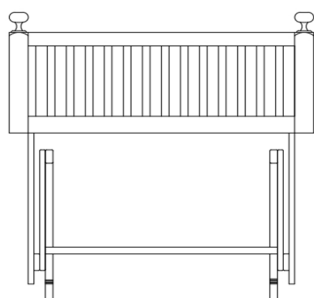

Fig.1 Product development process

III. DESIGNANDFABRICATION

Fig.2 Design of Automatic Cradle

1. OUTER FRAME
2. BASSINET
3. ROD
4. DC MOTOR
5. MICRO CONTROLLER

Fig.3 2D View Automatic Cradle

A. *Materials*

In this work components used as given below,

1) *Base:* the overall weight of the cradle is supported by base.
2) *Bassinet:* this part is preferred to lay down the baby
3) *Rod: rod* converts the rotating motion of the cradle to swinging motion.
4) *DC motor:* the swinging is initiated by the DC motor
5) *Aurdino:* the micro-processor is the main core part of the cradle. The swinging speed is being controlled by the microprocessor
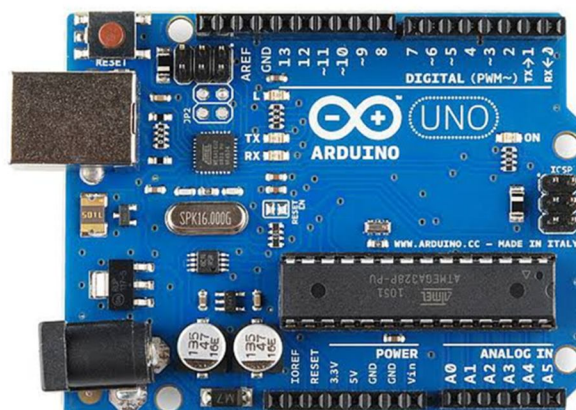6) *Motion sensor:* the sensor senses the movement of the baby and initiate their swinging baby

Fig.3 Aurdino

Fig.4 DC Motor

IV. FABRICATION TECHNIQUES USED AND ASSEMBLED MODE

This process is carried out by using following program as given below.

```
#include <Servo.h>
#include <SoftwareSerial.h>
SoftwareSerial mySerial(9, 10);
int sensorPin = A0; // select the input pin for the potentiometer // select the pin for the LED
int sensorValue = 0;
int count=0;// variable to store the value coming from the sensor
int motor=8;
int motor2=10;
void setup ()
Serial.begin (9600);
mySerial.begin(9600); // Setting the baud rate of GSM Module // Setting the baud rate of Serial Monitor (Arduino)
delay(100);
pinMode(motor,OUTPUT);
pinMode(motor2,OUTPUT);
void loop ()
{ delay(200);
sensorValue = analogRead (sensorPin);
Serial.println (sensorValue, DEC);
if(sensorValue > 65)
{ digitalWrite(motor2,LOW);
digitalWrite(motor,HIGH);
delay(400);
digitalWrite(motor,LOW);
digitalWrite(motor2,HIGH);
delay(400);
else
digitalWrite(motor2,LOW);
digitalWrite(motor,LOW);
if(count>5)
if (Serial.available()>0)
switch(Serial.read())
case 's':
SendMessage();
break;
case 'r':
RecieveMessage();
break;
if (mySerial.available()>0)
Serial.write(mySerial.read());
void SendMessage()
mySerial.println("AT+CMGF=1"); //Sets the GSM Module in Text Mode
delay(1000); // Delay of 1000 milli seconds or 1 second
mySerial.println("AT+CMGS=\"+919995856777\"\r"); // Replace x with mobilenumber
  dela(100);
```
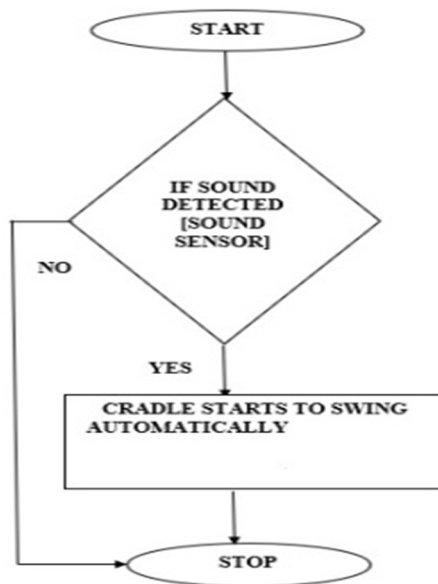
V. BLOCK DIAGRAM

Fig.5 Block diagram

VI. WORKING PRINCIPLE

The cradle is designed like it starts to swing automatically when the baby starts crying. Here we have used sound sensor which senses crying sound of the baby, then the gear motor starts to rotate thus the cradle swings .When the baby cries the sound is absorbed by the sound sensor and it makes the motor to swing. This system emphasizes the importance of child care.

VII. ACKNOWLEDGEMENT

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VIII. RESULT AND DISCUSSIONS

The product is produced, even considering the high material cost, it is easier to construct and less consumption of energy as compared to other fabrication materials, process, assembling, drilling, cutting and painting are simple. This vehicle cleans hundred square feet area within 6.5 minutes and large amount of dusts are to be collected.

SI NO	CRITERIA	AUTOMATIC CRADLE	OTHER TYPE CRADLE
1	COST	Low cost	High cost
2	SWING DURATION	High	Low
3	OPERATION	Easy	Difficult
4	SEMIAUTOMATIC	Yes	No
5	MAINTANANCE	Low	High
6	WEIGHT	Low	high
7	TIME DURATION OF SWINGING	6 – 10 min	No time
8	BEARING REPLACMENT	Required	Not required
9	CONSTRUCTION	Simple	Difficult

IX. CONCLUSION

Looking after babies is hard problem worldwide. Babies are society future. This system emphasizes the importance of child care. The above designed system is economical and user friendly and very useful for working parents and nurses. They can manage their work efficiently. With the development of technology day to day work has been eased for parents along with baby care. Otherwise, mother's lap would be best cradle for baby. The proposed design is an improvement on previous intelligent cradles as it naturally achieves the energy saving target in accordance with resonance theory. In addition, it has a much lower operating noise which will be welcomed by parents. It is also hoped that more infant cries can be used in the future and, by connecting to the Internet, the recorded cries will be available for medical diagnosis. Some modern techniques, such as pattern recognition, will be applied to recognize more types of infant cries in the aspect of intelligence.Visible output of work is being presented as paper entitled "Design and Development of Automatic Cradle".

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