AUTOMATIC PHYSIOTHEROPY MACHINE FOR LEG WITH ADVANC FEATURED AND REASONABLE IN COST

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ABSTRACT: This paper illustrates an overview of various physiotherapy machine. In many physiotherapy centers the use of physiotherapy machine is limited due to the cost of equipment. The old physiotherapy machine is quite expensive and needed to operate manually and are heavy in weight. In India the cost of machine is big concern for its use in rehabilitation centers. By using latest cost effective control method, the labour, machine and material cost in India comparatively low from overall point of view, the cost of machine has been reduced by seventy percent without compromising quality, functionally and accuracy of the machine. Hence for the “low cost knee physiotherapy machine is the main aim of our project.” Using modern technology such as PIC microcontroller, angle sensor, screwdriver mounted on pipe and gear motor we design a machine which can afford every person as per their requirement, i.e., To design advance, automatic, useful, easy to handle and most important low in price are the objective of our project.

Keywords: Rehabilitation, Microcontroller, Angle sensors.

1. INTRODUCTION

Physiotherapy words is the combination of physical and therapy. Physiotherapy is the important part for leg fractures patients with arthritis. Its assist by physiotherapist who are the part of healthcare who helps in maintain an active, healthy and independent life at home as well as work. But it is quite difficult for leg fracture patients after receiving the treatment or operation. In this case they have the pain in their injury and in this case they cannot go daily to physiotherapy centers. This proposed work i.e., Automatic physiotherapy machine for leg with advance feature and reasonable in cost helps to them in such a way that they can use this machine at their home or any location in which they feel comfortable to use. The advance feature of this machine is that they have to set limit in mobile or pc or laptop which will sense the angle sensor and gives the signal to microcontroller and microcontroller controls the entire machine. The main things there is no need of physiotherapist and machine gives more comfort to the patient. Which also gives relief from pain, gives flexibility, increase the range of motion and correct the position of body.
2. EXISTING MACHINE:

The old physiotherapy machine have to be operated manually. It has main components like microcontroller 8051, sensor, and DC motor. The microcontroller has less memory which does not have Eprom with less bytes. From this survey we found that we can modify this machine into automatic operation which can operate with the help of Bluetooth by using mobile, pc, laptop, and can also provide this machine to everyone which is affordable, less in weight and can use at home, office, which consumes less power and also saves valuable time of physiotherapist.

3. PROPOSED WORK

Actual Innovation of design consist of pic Microcontroller from 16F886 family, Angle sensor, screw driver mounted on the pipe. The block diagram of automatic physiotherapy machine for leg is given below. fig:3.1 Block diagram of physiotherapy machine

The constant power supply is 220 volt /50 Hz. But microcontroller is an electronic device which can only operate on minimum voltage i.e to regulate the voltage we used voltage regulator which supplies the power to microcontroller and microcontroller to other equipments. Here the microcontroller used is PIC microcontroller which is from 16F886 family. It has higher flash memory along with 24 programmable output or input pin.

4. HARDWARE USED:

1: PIC Microcontroller [16F886]  
2: Regulator IC 7805  
3: Driver IC ULN2003  
4: Capacitor  
5: Relays  
6: Diodes  
7: Angle sensor  
8: Step down transformer  
9: 4 pin Bluetooth  
10: LCD 16 character  
11: Gear motor  
12: resistance

5. RESULT

From this project we found that the oscillation can be adjusted.
The CPM machine will bend joint for according to angle settings. The Physiotherapist may program the CPM machine to increase the amount that the joint is flexed over time. Oscillations may prevent scar tissue from forming. This may also prevent pain and stiffness in the knee.

- Muscles may get stronger more quickly.
- The CPM machine will gently exercise leg muscles to prevent them from getting weak. Tendons and ligaments, the tissue that connects to the muscles and bones, may also get stronger by using a CPM.
- Patients may have less pain. A CPM machine will elevate leg and decrease swelling. Patient may have less pain if your swelling is decreased.
- You may have increased blood flow in your arm or leg. Increased blood flow to your tissues will help you heal faster.

6. CONCLUSION

From the exiting various types of physiotherapy machine for leg we conclude that these machine are quite expensive and are difficult from one place to another and which uses lots of power to operate the machine and also has limitations. Hence forth, we design such a machine which is 70% less in cost with more advance features and light in weight which can give more comfort to the patient. For all these reason we want to implement a system which is Automatic, advanced, Easy to handle and can consume low power. That’s why we are designing Automatic Physiotherapy machine for leg with advance featured and reasonable in price.

7. FUTURE SCOPE:

- Its motion angle can be increase up to 120°
- Manually motion angle setting (0° to 120°) and working time of machine can be provided.
- Machine operation can be extended up to fingers as well as shoulder.

8. REFERANCE:


