Design of Low Cost Electronic Stimulator for Physical Exercise and Treatment

V. Sailaja, G. Ravanaiah* and C. V. Narasimha Murthy
Vikrama Simhapuri University P.G.Centre, Kavali. SPSR Nellore Dt.A.P.
*J.B.Degree College, Kavali. S.P.S.R. Nellore District. A.P

ABSTRACT

The localized exercises can be brought about by electrical stimulations and massages. These exercises also exert considerable impact on the metabolism of all tissues in the body with clinical significance. Hence they can be exploited to induce exercising physically disabled persons and in the treatment of muscle disorders. In the present study an attempt is made to design a low cost electronic stimulator for treating various muscular disorders. The electronic stimulator releases impulses through the skin and stimulates the nervous in the surroundings. Such impulses are highly useful in maintaining the muscle tone without any physical activity. This devise was developed is based on voltage to current converter process. It produce bipolar current pulses of 11.5 mA with 15V current source these signals coming out of the wires tested by using the audio output of the personal computer. The stimulator had pulse width ranging from 0.12 -10milli seconds. This can be used for treating muscular atrophies, myolgia, sprains; The use of the stimulator in the treatment of various muscular problems is discussed.

Key words: Muscular exercises, Electronic stimulator, Prevention of Muscular Disorders.

Introduction:

Electronic Stimulators are gadgets used for muscle and nervous stimulation (Land et. al 2004, Glicelli 2006) Electronic stimulators are used for the treatment of neuromuscular disorders such as muscle spasms, atrophy apart from improving of local blood circulation. Sometimes they are also used for post surgical stimulation of muscles to prevent thrombosis. Electrical stimulations in vivo conditions have also been exploited towards arrest of muscle wasting during muscle disorders like atrophies and dystrophies (Herbison et al., 1973., Paul et al., 1997, Olivo 2003,)

Hence in the present study an electric devise which is muscle stimulator is designed which is effective and efficient.

Materials and Methods:

An electronic circuit is designed as shown in the figure. This can be operated by 3V battery this power supplies voltage to a chip ICI 7555 through VCC from this chip output goes to T1 BC 327 Transistor. It produces damped oscillations at a frequency of 2.5KHz with a repetition rate of 100HZ. The pulses produced are sent to small transformer with 4.7 microF capacitor which increases the output voltage. However the pulse width can be adjusted using a potentiometer connected to the ON / OFF switch.

From the transformers output signals are connected to 2mm banana plugs and from these 2 adhesive electrodes which are available in the surgical equipment shop by changing the potentio meter settings we can create signals of either low intensity of pulses for parts of the body such as arm and high intensity pulses are used for knee and legs.
Results and Discussion:
In the present study a small muscle stimulator was designed. The Preliminary results shows that this can be used for muscle spasms muscle atrophy agglutinating blood circulation and in the treatment of cellulites the electronic muscle stimulator is having several advantages.
1. It is low cost equipment
2. It is heavy integration of several programmes such as automatic stimulations

REFERENCES