

Advanced Digital Lymphedema Equipment

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Abstract

It uses a compression and deflection to leg and hand within body tissues. The purpose of our study was the evaluation of self-reported incidences of lymphedema in breast cancer survivors and the effect of providing the patients with information about lymphedema on the extent to which lymph-drainage massage services and compression garments were used. Lymphedema therapy uses air compression to infllect and deflect air in culf. Diathermy uses high-frequency electric current to produce heat deep inside a targeted tissue. It can reach areas as deep as two inches beneath the skins surface.

Keywords: SPD sensor, microcontroller, oscillator, compressor.

INTRODUCTION

The goal of using a pump in the treatment of lymph edema is to transport extra fluid out of the affected limb and go back it to the cardiovascular gadget. A pump is used by some remedy centers as a part of a expert carrier. a fair greater crucial function of the pump is for use at home by way of a affected person who has beentrained in its proper use. Lymph edema is the build-up of lymph fluid in the body's tissues due to damage in the lymphatic system. It occurs when the lymph system cannot remove the fluid, it normally does from the tissue. This build-up causes abnormal swelling, often of an arm or leg.

Lymphedema can be primary or secondary. Primary lymph edema is seen in people who are born with abnormalities in the lymphatic system. Secondary lymph edema is a complication that can occur after cancer treatments (e.g. surgery, lymph node removal, radiation therapy). Lymph edema is usually seen in the part of the body that had the specific cancer treatment. Secondary lymph edema is the most common type of lymph edema in North America. Lymph edema is a very

different condition and requires specific treatment

OBJECTIVE

The objectives of project are

Make continuous blood circulation of affected area:

The lymphatic and venous systems work together to maintain fluid balance in the body. In a normally functioning circulatory system, arteries carry oxygenated and nutrient-rich blood from the heart to all parts of the body. The veins then carry the blood, depleted of oxygen and nutrients, back to the heart for reoxygenation.

Reduce pain of patient in targeted body:

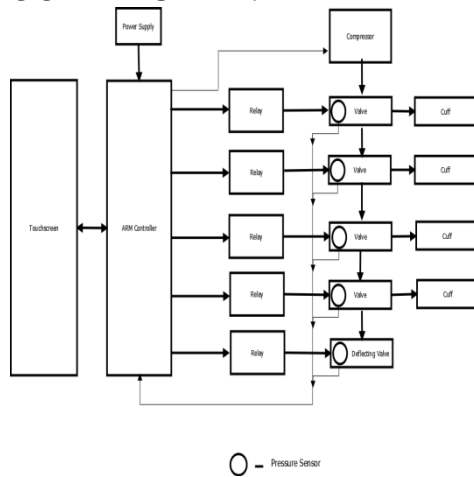
A compression or Lymphedema pump is used with a leg or arm sleeve for patients with extreme swelling. There are patients who require both lower and upper extremity sleeves. The compression arm or leg sleeves are put around the extremity and it attaches to the lymphedema compression pump.

Relax patient from pain:

Despite the fact that pumping facilitates many human beings, there had been some instances wherein pumping ends in hardening of the tissue on the very top of

the arm (fibrosis). It's notion that the lymph is propelled there by the pump but then starts to build up, leading to tissue changes. make sure to name your therapist in case you word something unusual. Your pleasant bet isn't to depend on pumping on my own to deal with lymphedema, but use it in combination with different remedies. [2]

BLOCK DIAGRAM:



**Hardware Design:
Step up Transformer**

A transformer where in the output (secondary) voltage is extra than its input (primary) voltage is known as a step-up transformer. The step-up transformer decreases the output modern for keeping the enter and output energy of the machine identical. The primary winding of the step-up transformer is made up of thick insulated copper wire because the low magnitude current flows through it.

SPD Sensor (Smart pressure device sensor):

In this project we also use the clever pressure device SPD device sensor. The gauge type simply measure the stress with admire to the atmospheric stress absolutely the type includes a reference vacuum chamber that's formed at the dia at some stage in production. There is also a category of strain sensors which are designed to measure in a dynamic mode for shooting very

high velocity changes in stress. instance programs for this form of sensor might be inside the measuring of combustion strain in an engine cylinder or in a gasoline turbine. those sensors are generally manufactured out of piezoelectric substances inclusive of quartz. [7]

Some pressure sensors are pressure switches, which turn on or off at a particular pressure. For example, a water pump can be controlled by a pressure switch so that it starts when water is released from the system, reducing the pressure in a reservoir.

Oscillator

An oscillator is a circuit which produces a continuous, repeated, alternating waveform without any enter. Oscillators essentially convert unidirectional contemporary waft from a DC source into an alternating waveform which is of the preferred frequency, as determined by way of its circuit components. The basic principle in the back of the running of oscillators can be understood through analyzing the behavior of a LC tank circuit proven through determine 1, which employs an inductor L and a totally pre-charged capacitor C as its components. Here, at the beginning, the capacitor starts offevolved to discharge via the inductor, which results inside the conversion of its electric power into the electromagnetic discipline, which may be stored in the inductor. Once the capacitor discharges absolutely, there will be no contemporary drift in the circuit. However, via then, the stored electromagnetic subject would have generated a returned-emf which results within the waft of current thru the circuit in the equal course as that of before.

PIC Controller

PIC microcontrollers (Programmable Interface Controllers) are electronic circuits that can be programmed to carry

out a significant range of duties. They may be programmed to be timers or to govern a manufacturing line and lots extra. They may be observed in maximum digital gadgets inclusive of alarm structures, pc manipulate systems, telephones, in reality almost any electronic tool. Many types of % microcontrollers exist, although the best are possibly discovered in the GENIE range of programmable microcontrollers. Those are programmed and simulated with the aid of Circuit Wizard software.

PIC Microcontrollers are exceptionally cheap and may be sold as pre-constructed circuits or as kits that can be assembled through the user.

LCD Display

LCD (Liquid Crystal Display) screen is an electronic show module and find a wide range of programs. A 16×2 lcd show may be very fundamental module and could be very generally utilized in various gadgets and circuits. these modules are preferred over seven segments and other multi segment LEDs. The motives being: LCDs are in your price range; without problems programmable; don't have any problem of displaying unique and even custom characters (unlike in seven segments), animations and so on.

Compressor

A compressor is a mechanical tool that will increase the stress of a gas with the aid of decreasing its volume. An air compressor is a particular sort of gasoline compressor.

Compressors are much like pumps: each boom the stress on a fluid and each can delivery the fluid thru a pipe. As gases are compressible, the compressor additionally reduces the quantity of a gasoline. liquids are distinctly incompressible; while a few may be compressed, the main action of a pump is to pressurize and delivery beverages

An air compressor is a device that converts strength (the usage of an electric powered motor, diesel or gasoline engine, and so on.) into capacity strength saved in pressurized air (i.e., compressed air). by one in every of several techniques, an air compressor forces more and more air right into a garage tank, increasing the stress. When tank stress reaches its upper restriction the air compressor shuts off. The compressed air, then, is held within the tank until referred to as into use.[1] The electricity contained in the compressed air can be used for an expansion of applications, utilising the kinetic strength of the air as it's far released and the tank depressurizes. while tank stress reaches its lower restriction, the air compressor turns on again and re-pressurizes the tank.

An air compressor must be differentiated from an air pump which merely pumps air from one context (regularly the encompassing surroundings) into some other (such as an inflatable bed, an aquarium, and so on.). Air pumps do no longer contain an air tank for storing pressurized air and are usually plenty slower, quieter, and less high priced to own and function than an air compressor.

Result

Lymphedema can decrease mobility, dexterity, range of motiCon and the ability to perform daily activities. With effective treatment, however, patients can manage their symptoms, minimize infections, and improve their health and quality of life.

Compression therapy is well-established as a cornerstone of lymphedema therapy. Compression to the limb may be applied in various ways including multi-layer bandaging, elastic compression stockings, custom compression garments and intermittent pneumatic compression devices. Barriers to effective compression, including difficulty in self-application of

bandaging and compression stockings as well as inability to tolerate some forms of compression, must be thoroughly evaluated so each patient is provided with a compression therapy that is effective and compatible with the individual's self-care ability

ADVANTAGES

- Swelling
- Postoperatively to reduce the possibility of developing a deep vein thrombosis
- Even though the disease is severe, using this treatment it recovers quickly
- Highly secured and reliable

APPLICATIONS

- At medical colleges.
- Hospitals
- Medical camps
- Research centre

CONCLUSION

The aim of this has been to integrate modern technologies with a view to enhancing the Elephant disease patient swelling the solution is available, with a view to betterment of Mankind. For this System designed by us makes it for easy to use for doctors & patients also. The breathable and comfortable calf, foot and thigh cuffs enhance the patient experience and are compatible with one universal pump. A pneumatic pressure treatment system that repeats expansion and shrinkage with four –tiered sequential pneumatic pressure to vitalize the circulation of blood and lymph in arms and

legs enhances the pressure of muscular tissues to remove patient's physical function from disabilities or agedness. By using Lymphedema Touch Screen Equipment we can reduce the pain in swollen area of patients and blood will flow continuous.

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