

(54) Title of the invention : Bluetooth-enabled, Lightweight, Portable, Inverted CPM machine with Mobile Interface for Post-Knee Replacement Rehabilitation

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(57) Abstract :

After a knee joint surgery or due to ageing or due to post knee replacement, rehabilitation therapy cause severe pain and immobility of the patient, the tissue around the knee become harder and knee stiffness will occur, which may cause many problems such as scar tissue swelling, bleeding, and fibrosis. A CPM (Continuous Passive Motion) machine is an apparatus that is being used to patient recovery, retrieving moving abilities of the knee, and reducing tissue swelling, after the knee joint surgery. This device prevents frozen joint syndrome (adhesive capsulitis), joint stiffness, and articular cartilage destruction by stimulating joint tissues, and flowing synovial fluid and blood around the knee joint. In this study, a new, light, and portable CPM machine with an appropriate interface, is designed and manufactured. The knee joint can be rotated from the range of motion (ROM) 0° to 120° with a pace of 4 degree/sec of angular velocity by this machine. One of the most important advantages of this new machine is its own user-friendly interface. This apparatus is controlled via an Android-based application; therefore, the users can use this machine easily via their own smartphones without the necessity to an extra controlling device. Besides, because of its apt size, this machine is a portable device. Smooth movement without any vibration and adjusting capability for different anatomies are other merits of this new CPM machine

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