Design and Manufacturing a Programmable Physiological Flow Pump

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Abstract:

The present project was set up in the response to a need for mimicking the pulsatile flow conditions in laboratory specially, the beating heart flow conditions in arteries and different organs. The ability to reproduce realistic arterial flow waveforms in vitro is essential in the study of vascular haemodynamics and also calibration of some clinical techniques in blood flow measurement. Different mechanisms were proposed for satisfying these flow conditions. Consideration weakness and advantages for each individual mechanisms, one suitable design was selected.

For this mechanism procedure of design, the parts and needed materials were studied. The main requirement was to provide the suitable precision of the mechanism to produce a predetermined periodic flow wave form. Following this design the parts were constructed and tested. At percent stage the system is capable to produce a flow waveform with 400 ml/s. This system based on the maximum amount outflow and the driving system is considered a novel system.

Key words: Flow simulator, Physiological flow mimicking, Pulsatile pump, Periodic Waveform