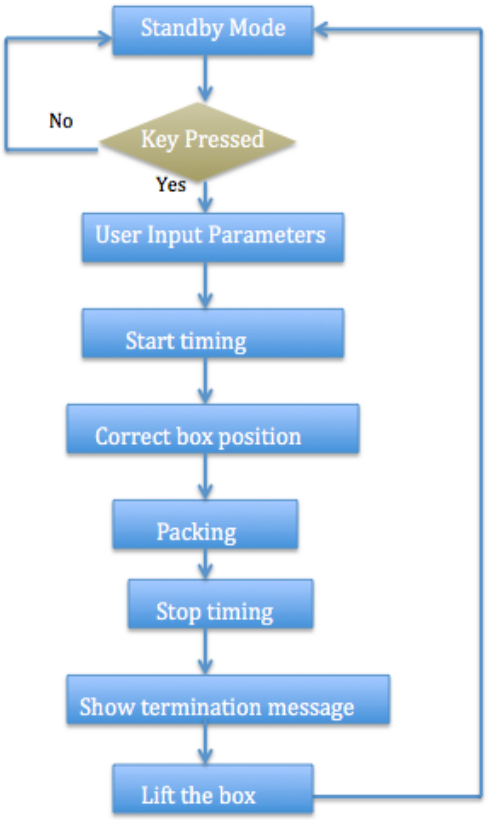
Flowchart

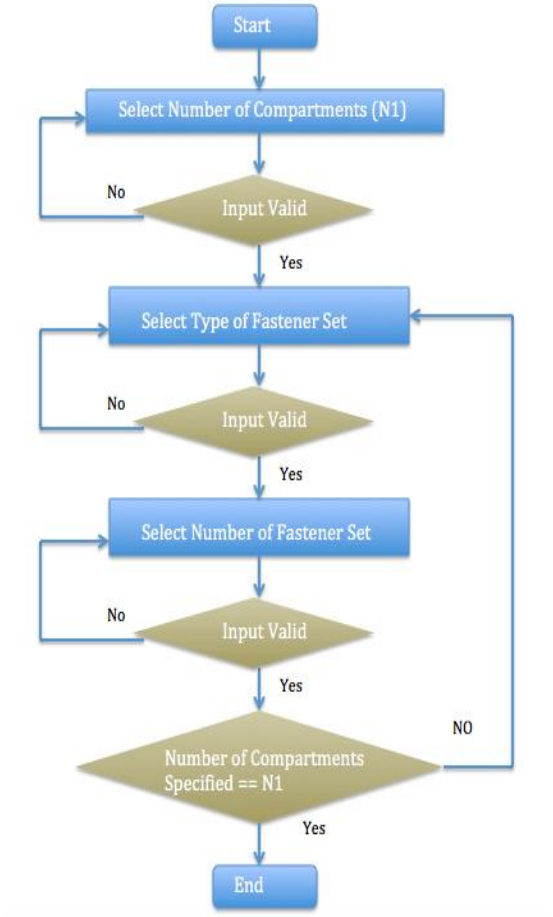
Overall Operation Logic

Initially when no key is pressed on the keypad, the machine is in the standby mode and waits for the user's instructions. When key is pressed, machine asks for the user's input and will start the packaging operation. The overall process includes correcting the lid position, opening the box sector, counting and loading, and termination. After the process ends, the machine goes back to the standby mode and is ready for the next operation. This process is implemented using interrupt. The interrupt bit is enabled when key is pressed and cleared after the termination of operation.



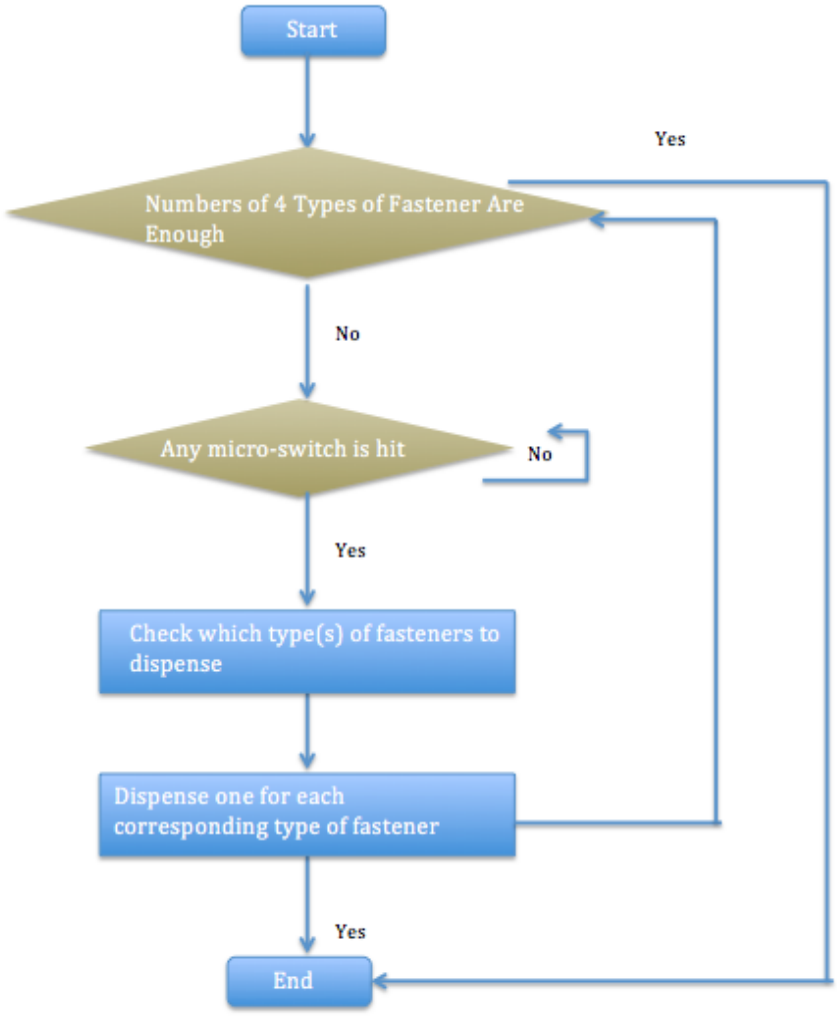
Parameters Input

The user will input three parameters for their desired packaging pattern: number of comparts filled, the type of fastener set for each compartment and the number of fastener sets for each compartment. The machine would only accept the user's input when the input is valid. Otherwise, it will require for the input again, until a valid input is entered.



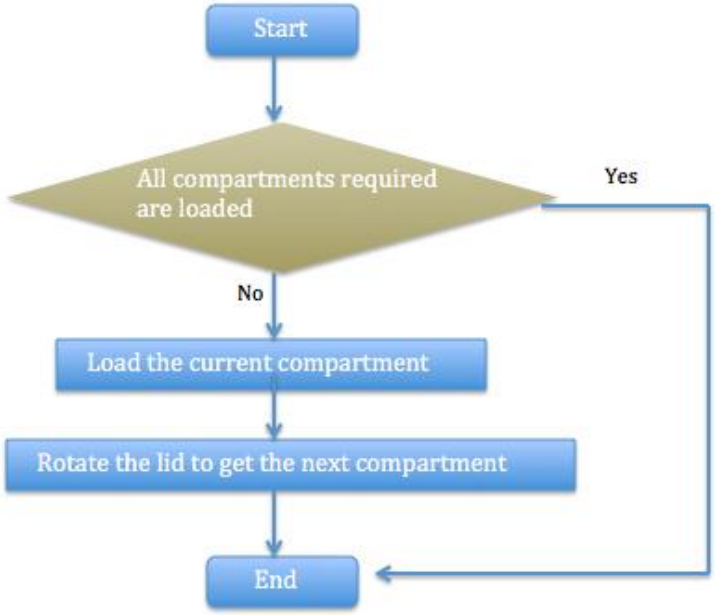
Correcting the Position of the Lid

Initially when the box is placed into the machine, the position of the knob of the lid with respect to the box is arbitrary. However, the knob should be aligned with the white sticker on the box circumferences in order to locate the compartments that are numbered form C1-C8.



Packing to Different Compartments

The compartments that are specified by the users will be loaded in turns.



Rotating the Box

The rotation of the box is done by a DC motor, which does not have an accurate control of the speed and angle. Therefore, an encoder is implemented to control the angle of rotation, by counting how many teeth on the gear have passed through a certain point in a circle.