Electrical Engineering Technology

"Scale Alarm Clock"

Project Proposal

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I.   ABSTRACT

I propose to make a Scale Alarm Clock for the ground that uses the scale portion as the switch to snooze off the alarm. The user will be able to program the alarm clock just like a normal alarm clock. The scale portion will snooze off the alarm and measure weight of the user to be read on the display.   The Scale Alarm Clock shall dual function as a weight scale and alarm clock.   The weight scale will display measured weight after snoozing the alarm by stepping on it.

II.   DESCRIPTION

The Scale Alarm Clock will rely on a microcontroller for its core functions. The microcontroller board will initiate and maintain the clock sequence, take measured pressure from the scale, take and store input from the user for clock settings, and run the LCD display. A visual has been provided below, Figure 1.
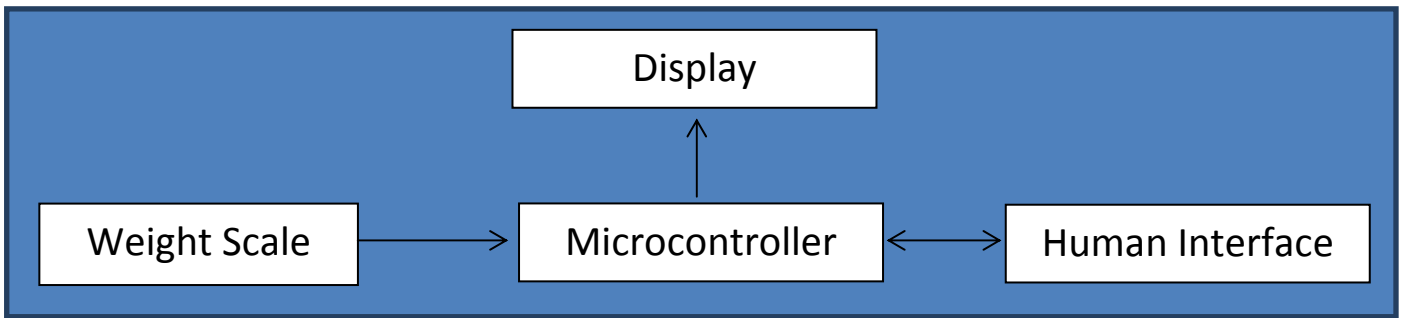

Figure (1) Scale Alarm Clock Block Diagram

The scale portion of this project will be half the project. Most digital weight scales use a load bridge cell sensor feed to an op-amp, which is then filtered by a low-pass filter on to an A/D converter. I intend to create something similar so the microcontroller can process a produced digital signal for the user's measured weight. The user's weight will be displayed in pounds, the United States standard for unit of mass. This scale will also work closely with the clock portion, functioning as a snooze for the alarm clock. The snooze will be programmed to trigger at a lower than average weight so anyone can turn off the alarm by stepping on the Scale Alarm Clock.

The clock portion will be the other half of the project. The clock will be running continuously when powered, defaulting back to a starting time if reset. The clock will be coded to display a 12-hour AM/PM real-time clock. Intended for the clock will be seven control buttons that will allow typical clock functions such as set time, set alarm, snooze, hour-increment, minute-increment, volume, and alarm on/off.   These controls will provide the user an interface to work with the Scale Alarm Clock as a whole.

The last part of the Scale Alarm Clock will be the display. This display will display time information and weight in pounds (lb). This display will be implemented with a common LCD display package.

III.　　BENEFITS AND SOCIETY'S IMPACT

The Scale Alarm Clock will provide those who have trouble getting out of bed an alternative style alarm clock. A standard nightstand alarm clock is easy to snooze and go back to sleep. The benefit of the Scale Alarm Clock is that it forces the user out of bed. The way to snooze/turn off the Scale Alarm Clock is by getting out of bed and stepping on it, which is a common difficulty for me. With a built in weight scale, users will also get the benefit of knowing their daily weight, making users become weight conscious. According to CDC.gov, one-third of U.S. adults are obese, a percentage that has been rising for the past 20 years.   I hope that a product like the Scale Alarm Clock will help make our society more weight conscious, inspiring more individuals to make healthier choices every day. Specifically, consumers' on a weight watcher diet or even wrestlers who need to watch their weight will be the target audience because they would directly benefit from the Scale Alarm Clock.

Users of the Scale Alarm Clock are forced out of bed to turn off the set alarm while given a morning reading of their weight to start their day with. Being such a unique type of alarm clock, it will have serious benefits to those who have trouble getting out of bed and/or stepping on a scale.

IV.　　SIMILAR PRODUCTS

1. Carpet Alarm®　　　　　　　　　　　　　　　2. Health O Meter Scale®

Figure (2)　　　　　　　　　　　　　　　**Figure (3)**

Both products in figures 2 and 3 are different in there function but offer an equally important concept to my total project. The creative solution of combining these two ideas for the complete system is where it gets its uniqueness. The Carpet Alarm® is intended to get people out of bed while the Health O Meter Scale® is meant to motivate people to live

healthier.   The proposed alarm clock will combine these ideas for a greater use that would kill two birds with one stone.

V.   PROJECT DEVELOPMENT AND DEMONSTRATION

The project will be developed using a microcontroller board. The board will work as the microprocessor for the whole system. A programmable development board will provide discreet logic components for some, if not all, analog components such as the amplifiers and A/D converter needed in the weigh-scale system. Materials used will be based on working results from development tests performed during the development stage starting after fall quarter.

The successful development of the Scale Alarm Clock depends on success in creating the alarm clock, weigh scale, and combination of these for a complete product. There exists support documentation for alarm clocks and weigh scales.

The project will be demonstrated using the actual product. One will be able to see the working time and use clock functions to edit the clock. Simulation will also be run so one can use function of the scale at any time. Finally, it will be shown in real time use as if someone needed to wake up during the demonstration, with low volume.