

## Smart Repetition Counter

### Summary

This invention disclosure describes a wearable device that is specifically designed to help users keep track of repetitions during fitness/exercise workouts. Beyond the initial fitness use case, this device could also have potential commercial or industrial utility.

### Description

When working out in a gym/home gym, it is common to perform a number of repetitions of a particular exercise (for example, 20 sit-ups or 20 push-ups). When performing these repetitions one must consciously keep track of how many repetitions have been completed, but it is a common phenomenon that during this exercise the mind will wander and lose track of the repetition count. The proposed device is a convenient way to automatically keep track of the completed repetition count, and display that information to the user.

From the perspective of the user, the device is basically an LCD screen and a directional input pad/controller, similar to the conceptual design shown in Figure 1 below.

*Figure 1 - Conceptual Design*



Within the case, the device also contains an accelerometer/gyroscope, processor, memory, battery, and potentially a network adapter. The device has two basic modes of operation: 1. Learning Mode, and 2. Workout Mode.

1. In Learning Mode, the user “teaches” a particular exercise to the device. The user inputs a name for the exercise using the directional input pad (for example, “push-ups”), puts the device onto an appropriate part of the body for that exercise (for example, the device is attached to an elastic band and placed on the upper arm) and then proceeds to perform several (10) repetitions of that exercise, pressing the “select” button of the directional pad after each repetition. The device also displays the number of the current learning repetition, and allows the user to erase/delete a poorly performed repetition. During each repetition, the device captures the accelerometer/gyroscope data. After the series of repetitions has been completed, the device uses the accelerometer/gyroscope data to build a model of the exercise repetition, with some additional tolerances to allow for slight variations in the movement of the user. Once the user has “taught” an exercise to the device, that exercise becomes available in the list of exercises available for Workout Mode.
2. After the user has programmed exercise(s) in Learning Mode, Workout Mode is the typical mode for daily use of this device. In Workout Mode, the user selects an exercise using the directional pad, and presses the “select” button to start the repetition counter. As the user proceeds to perform repetitions of that exercise, the device matches it’s model of that exercise repetition to

the current movement of the user (as captured by the accelerometer/gyroscope). As repetitions are completed, the LCD screen is updated to reflect the number of completed repetitions. In this way the device keeps track of and displays the repetition count, allowing the user to easily see this information. The user's mind is free to wander and the current repetition count can be seen in a quick glance.

Additional benefits could be gained if this device were to be connected to a data network. This could allow data to be logged to a more persistent location, and allow for live viewing of this data from another party.

### **Commercial Value and Customers**

This device would likely be first adopted by those who exercise regularly, but could potentially also have applications in workplace environments. For example, assembly line facilities may benefit from this device by allowing employees and employers to verify the number of times that a task/process was performed.

### **Invention Differences**

Some "smart wearables" that are currently on the market are designed to log exercises/movements, but they typically only help the user after the fact. They allow users to capture data that can be viewed at a later time to assist in workout regimen planning and personal health statistics. Other wearable devices may capture data and allow the user to see this data on a companion device (for example, a wristband or heart monitor that requires a smartphone/tablet to view the data). This device is specifically designed to aid the user while they are exercising, without requiring a secondary device.