Provisional Patent Application

ABSTRACT

A system and method for monitoring and recording and personalized instruction of fitness routines performed by a person using weight stack machines and free weight machines. The system is easily retrofittable at low cost on currently deployed exercise equipment and can also be incorporated into exercise equipment at time of manufacture.

DESCRIPTION

Fitness routines typically combine cardio vascular training with weight training. The cardio training is performed either with or without the use of equipment such as stair climbers, treadmills or elliptical machines. Fitness monitoring devices utilizing a sensor worn on the wrist , foot or other part of the body are available to assist people in monitoring analyzing and adjusting their workouts and fitness activity. However, these devices do not address the need to monitor and record the weight training component of a person’s fitness routing. Lacking this capability, disciplined exercisers will manually record their fitness regime by hand on a card noting the equipment used, weight at which the exercise was performed, repetitions per set and number of sets. Due to the need to interrupt their workout, others will choose not to record their activities. The history is useful to both analyze and adjust a person’s fitness routine and also adds an element of motivation because it can illustrate the progress an individual has made. Specialized apparatus have been invented to permit the monitoring and recording of fitness routines but they suffer from a number of drawbacks. These include being costly and difficult to retrofit on installed equipment, substantial incremental cost to manufacture in new equipment and the need for a commercial gym or home gym to implement an IT infrasctructure (typically consisting of a computer, network, software, etc)

The invention is a system which permits exercise machines and free weights already in use at commercial and home gyms to be retrofitted at very low cost and become part of a system that permits any user to monitor, record, analyze and optimize their fitness routines performed using this equipment. It also permits a user to travel to other gyms where this equipment has been retrofitted and perform these same activities.

One embodiment of the system utilizes an activity sensor, a smart phone, RFID tags and software running on the smart phone to capture the users’ fitness routine. A web site provides additional capabilities including the storage of historical fitness routines , tools to analyze and optimize a workout, canned workouts and sharing data with other members of the users’ social network such as trainers, team mates, gym personnel, etc.

The activity sensor incorporates an accelerometer, metal proximity detection circuit, RFID reader, microprocessor, battery and wireless transmitter. The wireless transmitter may be Bluetooth, Nike+ compatible ANT or some other RF transmitter. The activity sensor communicates with a receiver integrated into or externally connected to the exerciser’s smart phone. The exerciser’s smart phone is paired with the AS using idustry standard techniques. Software installed on the smart phone receives data from the AS to which it is paired.

For use with a weight stack type of exercise machine, an RFID tag is affixed to each weight on the machine. Each weight’s tag is pre-programmed with a data record that identifies the type of machine the exercise is being performed on (i.e. Leg Press) and the total weight that will be on the stack if the pin is inserted through it. One embodiment of the invention uses a modified version of the pin normally supplied by the manufacturer of the weight stack machine. The modified pin incorporates a sensor holder. The sensor holder secures the AS to the pin and assures positive alignment of the AS with the RFID tag and maintains the AS orientation relative to the motion of the weight stack. When the pin is inserted into the weight, a magnet on the pin holder draws it into direct contact with the weight and positively aligns it. This is sensed by the metal proximity detector circuit which is being polled by the microprocessor. The embedded software in the microprocessor responds to the sensing of the weight in close proximity to the AS by reading the RFID tag. The data read from the tag is transmitted to the smart phone. The smart phone app notifies the user the exercise machine and weight which has been selected. This notification can be via display on the screen, verbally or both.

As the user begins to exercise, accelerometer data is captured and sent to the smart phone app. The accelerometer data is processed by the smart phone app.