MARKSMANSHIP TRAINING DEVICE

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ABSTRACT

My invention is a device used to analyze the movement of a firearm prior to discharge to be used to train the shooter marksmanship.

A series of motion sensors such as accelerometers and angle rate indicators (commonly called gyroscopes) are mounted in either the magazine inserted into the firearm, on a device designed to mount onto the firearm, or made as a permanent part of the firearm or a simulated firearm. These sensors will measure the motion of the firearm in up to six degrees of freedom in three dimensional space as well as detect the fall of the hammer or firing mechanism.

The data from these sensors prior to the detection of the hammer falling is then sent to a computer either by wires or by a wireless transmission where the data is analyzed to detect the motion of the firearm prior to the hammer falling. This device can be used without ammunition (dry firing) or as an analysis of live fire performance.
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BACKGROUND OF THE INVENTION

[0001] The development of miniature solid-state gyroscopes and accelerometers makes it possible to analyze the motion of hand held objects under various configurations. The art of marksmanship requires extremely accurate control of the motion of the firearm. The process of training an individual in the art of marksmanship traditionally requires hours of practice with assistance by an instructor to observe the motion of the firearm by the trainee and the resulting impact points of the projectiles. The instructor then interprets the observations and gives feedback to the trainee until the trainee has the experience to interpret their own performance. This invention will perform immediate feedback to the trainee and instructor and allow the trainee to practice without an instructor present.

BRIEF SUMMARY OF THE INVENTION

[0002] Gyroscopes and accelerometers or combinations of accelerometers are attached to either an existing firearm or a firearm simulator so that the motion of the firearm can be measured. The sensors are connected to a computer via wires or a wireless data communication system. A computer then analyses the motion of the firearm to detect a trigger pull event in either dry-fire training or actual firearm discharge. The motion immediately prior to discharge or release of the firing mechanism is then analyzed and feedback is given to the user. The sensors may be integrated into existing components of the firearm such as the ammunition magazine or even a simulated ammunition cartridge.

SPECIFICATION

[0003] The invention consists of an inertial sensor or inertial sensors that are incorporated into a firearm or a simulated firearm or an apparatus to be attached to a firearm. The inertial sensors may be one or more gyroscopes and one or more accelerometers. The sensors are either incorporated or attached to the firearm or simulated firearm so that the motion of the firearm or simulated firearm is directly measured by the sensors. A processing module analyzes the data from the sensors and determines the motion of the firearm immediately prior to a trigger pull event and predicts the error in the impact point of the projectile due to the motion of the firearm.

The invention claimed is:

1. A firearm training system comprising inertial sensors affixed to a firearm or simulated firearm and a processing module that enables the user to detect a trigger pull event, analyze the motion of the firearm, and predict the impact point of the projectile.

2. A firearm training system of claim 1, wherein the inertial sensors comprises a single axis, dual axis, or triple axis gyroscope and a single axis, dual axis, or triple axis accelerometer.

3. A firearm training system of claim 1, wherein the components of the device are incorporated into an ammunition magazine so as to be removable from the firearm.

4. A firearm training system of claim 1, wherein the components of the device are incorporated into an enclosure that may be affixed to the barrel of the firearm.

5. A firearm training system of claim 1, wherein the processing module is a separate computer that contains the processing module logic and displays the results to the user.

6. A firearm training system of claim 1, wherein the inertial sensors communicate with the processing module through a wireless communication system.