

ELECTRONIC APPARATUS FOR DETERMINING THE ATTITUDE OF A WEAPON

Main Technological Area → Sensors

Keywords → View | Targeting | Aiming | Firing | Pitch | Roll | Attitude

An electronic apparatus couplable to a weapon, in particular to a grenade launcher, for determining, instant by instant, the Pitch, Roll and Heading angles of the weapon. These values will determine the instantaneous attitude of the weapon so as to employ such information in ballistic computing programs adapted to provide the operator shouldering the weapon indications in real time relating to the shooting attitude to be given to the weapon with the purpose of hitting a target.

TECHNICAL SPECIFICATIONS

The present invention is essentially based on the idea of making an electronic apparatus which is capable of:

- determining the components of the acceleration of the weapon along the axes of a reference system coinciding with certain axes of the weapon, in such a way that the movement of the weapon in space determines the same movement of the reference system;
- determining the components of the angular speed of the weapon along the axes of the reference system;
- determining the attitude angles of the weapon, indicated below with static attitude angles, based on the components of the acceleration filtered through a low-pass filter; the static attitude angles being determined under a condition of static nature during which the weapon is immobile or is moved with a negligible speed, i.e. less than a pre-established minimum threshold;
- determining a number of actual attitude angles of the weapon by integrating the angular speed components over time;
- determining some correction factors according to the difference between the actual attitude angles and the static attitude angles;
- correcting the components of the angular speed of the weapon based on the corresponding correction factors.

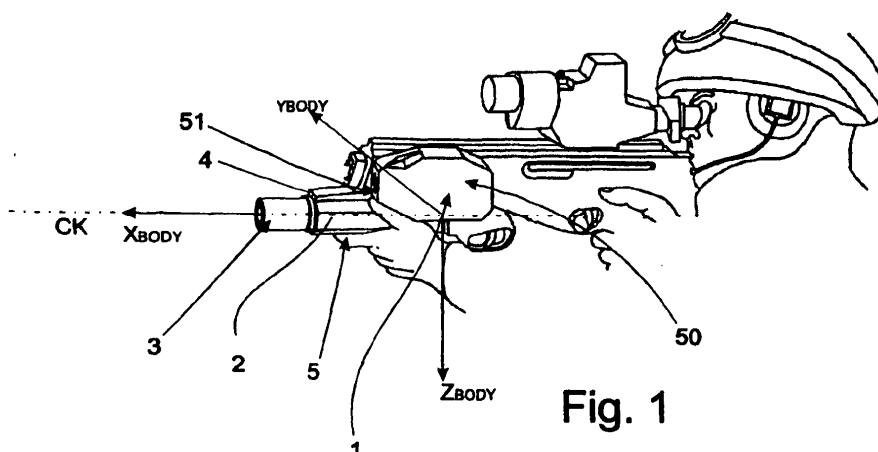


Figure 1 – The system in operating conditions

This electronic system has the advantage of providing an accurate indication of the attitude of the weapon, as the error introduced by the gyroscopes in speed measuring is eliminated due to the compensation obtained through the acceleration components provided by the accelerometers.

INNOVATION/ADVANTAGES

- Accurate indication of the attitude, resulting in better performance of ballistic computing
- Simple and affordable electronics architecture
- Small weight and volume

FIELDS OF APPLICATION

Police forces, public safety	Aiming and shooting systems in operative scenario, aircraft/drone visual tracking
Simulation/Videogames	Augmented Reality combat scenario, virtual shooting ranges
Science	Astronomy, space objects visual tracking

PATENT INFORMATION

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Active worldwide applications

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Leonardo internal code

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