PARTICAL DETECTION AND APPLICATIONS IN SECURITY AND PORTAL MONITORING

Abstract

Techniques, apparatus and systems for detecting particles such as muons. In one implementation, a monitoring system has a cosmic ray-produced charged particle tracker with a plurality of drift cells. The drift cells, which can be for example aluminum drift tubes, can be arranged at least above and below a volume to be scanned to thereby track incoming and outgoing charged particles, such as cosmic ray-produced muons, whilst also detecting gamma rays. The system can selectively detect devices or materials, such as iron, lead, gold and/or tungsten, occupying the volume from multiple scattering of the charged particles passing through the volume and can also detect any radioactive sources occupying the volume from gamma rays emitted therefrom. If necessary, the drift tubes can be sealed to eliminate the need for a gas handling system. The system can be employed to inspect occupied vehicles at border crossings for nuclear threat objects.

Fig. 6