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(54) **Title:** SYSTEM AND METHOD FOR DETECTION AND IDENTIFICATION OF FOREIGN ELEMENTS IN A SUBSTANCE

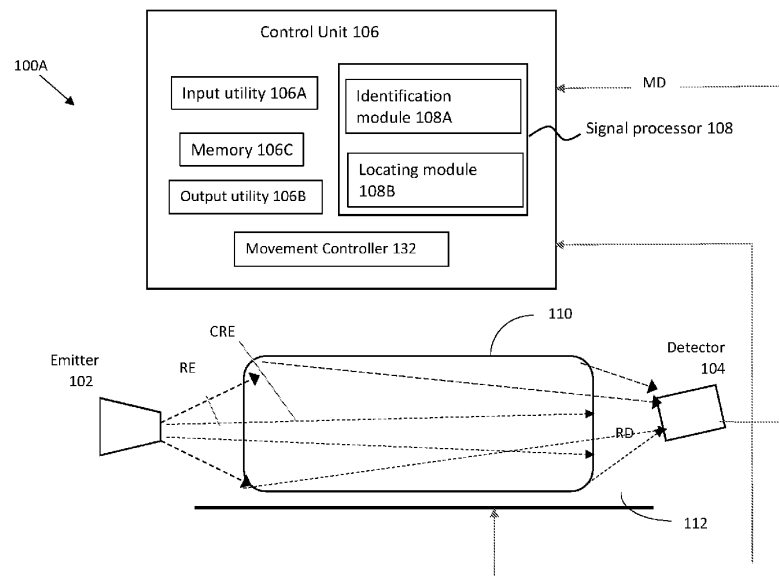


FIG. 2A

(57) **Abstract:** In one embodiment, a system and method for inspecting a substance to detect and identify predetermined foreign element(s) in the substance. The foreign element may carry X-ray responding material compositions, emitting X-ray signals in response to primary exciting X-ray or Gamma-ray radiation. The inspection is performed during a relative displacement between the substance and an inspection zone, defined by an overlap region between a solid angle of emission of an X-ray / Gamma-ray source and a solid angle of detection of X-ray radiation, along a predetermined movement path, as the substance moves along said path, the detected X-ray radiation includes X-ray response signals from successive portions of the substance propagating towards, through, and out of said overlap region. Measured data indicative of X-ray response signals is analyzed to identify a signal variation pattern over time indicative of a location of at least one foreign element carrying an X-ray responsive marker.

[Continued on next page]

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