Claims

1. A sensor system for a container, the system comprising:
an emitter of a detection radiation into the container;
a receiver of reflected radiation arranged to produce a signal based on received reflected radiation, wherein the received reflected radiation is produced by reflection of contents of the container;
a processor for interpreting the signal and preparing a transmission signal;
a transmitter of the transmission signal;
wherein the emitter, receiver, processor and transmitter are housed within a package that is integrally formed in a moulded plastic hinged lid of the container, with a layer of plastic covering the emitter and receiver, wherein the system is configured for the emitter to emit radiation that passes through the layer of plastic, and wherein the layer of plastic covering the emitter and receiver is formed during moulding of the moulded plastic lid so as to be integral with and continuous with the rest of the moulded plastic lid.

2. The system according to claim 1, wherein the system further comprises a power source for powering at least one of the emitter, receiver, processor and transmitter; wherein the power source is also housed in and sealed in the package when the moulded plastic lid is formed.

3. The system according to claim 1, wherein the system further comprises another sensor inside the package for detecting a property of the lid, wherein the property comprises acceleration and/or orientation and/or movement.

4. The system according to claim 2 or 3, wherein the package comprises a heat shield for shielding one or more of the emitter, receiver, processor, transmitter and power source from the heat of plastic moulding the package into the lid.

5. The system according to claim 1, wherein the system is sealed in the lid of the container.

6. The system according to any one of claims 1 to 5, wherein the emitter is capable of emitting radar and/or is capable of emitting a plurality of types of radiation one and/or is capable of emitting laser for a LIDAR detector.

7. The system according to any one of claims 1 to 6, wherein the processor is configured to determine a level of the contents in the container and a type of contents of the container.

8. The system according to claim 7, wherein the processor is configured to determine the type of material inserted into the container based on reflected radio frequency radiation.

9. The system according to claim 7, wherein the processor is configured to determine a density of the material of a deposited article and/or the thickness and/or characteristic (spectral) reflective properties based on the received reflected radiation.

10. The system according to claim 9, wherein the emitter is configured to scan an inside of the container is such that a shape or a dimension of an article inserted can be determined.

11. The system according to any one of claims 1 to 10, further comprising:
a processor for using a model to determine an event has occurred in relation to the container.

12. The system according to claim 11, wherein the model is configured to determine the type of material inserted into the container.

13. The system according to claim 11, wherein the model comprises an AI algorithm that learns one or more of: household waste disposal habits, street rubbish disposal habits, event disposal habits, wherein the event is one of: emptying of the container; tipping over of the container.

14. The system according to any one of claims 1 to 13, wherein the emitter is configured to emit pulsed coherent radar.

15. A method comprising:
emitting radio frequency detection radiation into a container, wherein the radio frequency detection radiation is pulsed coherent radar;
receiving a reflection of the emitted radiation from contents of the container;
interpreting the received reflection to determine the contents of the container by detecting the type of material of an article inserted/deposited into the container;
transmitting a signal representing the interpreted received reflection.

16. The method according to claim 15, wherein the emitted radio frequency passes through a layer of plastic formed during moulding of a moulded plastic lid which is integral with and continuous with the rest of the moulded plastic lid.