## CLAIMS

What is claimed is:

1. A container configured to store an item, comprising:

a surface defining a volume of the container; and

an electromagnetic state sensing device including one or more resonance portions printed on the surface of the container that include a three-dimensional (3D) carbon-containing structures configured to:

receive an electromagnetic radiation ping emitted from a user device;

resonate at a first frequency when the item in the corresponding portion of the container proximate to the resonance portion is in a first state;

emit a first electromagnetic radiation return signal at the first frequency or a variation of the first frequency;

resonate at a second frequency when the item in the corresponding portion of the container proximate to the resonance portion is in a second state; and

emit a second electromagnetic radiation return signal at the second frequency or a variation of the second frequency, the first frequency or the variation of the first frequency and the second frequency or the variation of the second frequency being different, allowing indicating a state of the item in a corresponding portion of the container proximate to the printed resonance portion.

2. The container of claim 1, wherein the resonance portion is configured to resonate at the first frequency in response to the electromagnetic radiation ping, emitting the first electromagnetic radiation return signal at the first frequency, when the item in the corresponding portion of the container proximate to the resonance portion is in the first state, and is configured to resonate at the second frequency in response to the electromagnetic radiation ping, emitting the second electromagnetic radiation return signal at the second frequency, when the item in the corresponding portion of the container proximate to the resonance portion is in the second state.

3. The container of claim 1, wherein a resonant frequency of the 3D carbon-containing structures is based at least in part on one or more physical characteristics of the item.

4. The container of claim 1, wherein a resonant frequency of the 3D carbon-containing structures is based at least in part on a permeability of the container.

5. The container of claim 1, wherein the state of the item comprises a presence of the item in the corresponding portion of the container.

6. The container of claim 5, wherein the resonance portion is configured to indicate the presence of the item in the corresponding portion of the container by generating the first electromagnetic radiation return signal in response to the electromagnetic radiation ping, and is configured to indicate an absence of the item in the corresponding portion of the container by generating the second electromagnetic radiation return signal in response to the electromagnetic radiation ping.

7. The container of claim 6, wherein the first electromagnetic radiation return signal has the first frequency, and the second electromagnetic radiation return signal has the second frequency different than the first frequency.

8. The container of claim 1, wherein the state of the item comprises a deformation of the item in the corresponding portion of the container.

9. The container of claim 8, wherein the resonance portion is configured to indicate the deformation of the item in the corresponding portion of the container by generating the first electromagnetic radiation return signal in response to the electromagnetic radiation ping, and is configured to indicate a lack of deformation of the item in the corresponding portion of the container by generating the second electromagnetic radiation return signal in response to the electromagnetic radiation ping.

10. The container of claim 9, wherein the first electromagnetic radiation return signal has the first frequency, and the second electromagnetic radiation return signal has the second frequency different than the first frequency.

11. The container of claim 1, wherein the item comprises a liquid, and the 3D carbon-containing structures is printed on an area of the surface of the container associated with a fill level of the liquid in the container.

12. The container of claim 11, wherein the electromagnetic radiation return signal indicates whether an amount of the liquid in the container exceeds the fill level.

13. The container of claim 11, wherein the resonance portion is configured to generate the first electromagnetic radiation return signal at the first resonant frequency based on the amount of the liquid in the container exceeding the fill level, and is configured to generate the second electromagnetic radiation return signal at the second resonant frequency, different than the first resonant frequency, based on the amount of the liquid in the container not exceeding the fill level.

14. The container of claim 1, wherein the user device is a smartphone, a radio frequency identification (RFID) reader, or a near-field communication (NFC) device.

15. The container of claim 1, further comprising an electrophoretic ink display configured to display the state of the item.