Background

[004] Pharmaceutical products are delivered to a user in many forms, including a pill. Integration of a pharmaceutical product with an ingestible device is often a challenge due to the delicate nature of the electronic components as well as the difficulty in securing the electronic components to the pharmaceutical product, such as a pill or tablet or capsule. For example, tablets are typically made using a press that applies pressure to a powder form. The pressures produced by the press can often damage the electronic components that are placed inside the tablet or pill. Additionally, securing the electronic component to the surface of tablet using adhesive material often results in damage to the device caused by the adhesive, which may be a thermally or chemically activated type of adhesive. Furthermore, handling a small electronic device is often a challenge during the assembly process. Therefore, what is needed is a system and method for securing an ingestible electronic device to a pharmaceutical product without damaging the ingestible electronic device.

Summary

[004a] In a first aspect of the present disclosure, there is provided a pharmaceutical product comprising:

a pill; and

a device including a top and a bottom, and secured to the pill, wherein the device comprises:

a non-conducting skirt that defines a central cavity;

a control unit positioned in the cavity defined by the skirt, wherein the control unit includes at least two dissimilar materials positioned on opposite sides of the control unit and electrically connected thereto, wherein the dissimilar materials, when exposed to a conducting fluid, create a voltage potential for powering the control unit and wherein

the control unit, when powered, generates a current flow wherein the current flow is controlled by the control unit; and

a securing portion on the bottom of the device for securing the device to the pill.

[004b] In a second aspect of the present disclosure, there is provided a pharmaceutical tablet with an electronic marker, the product comprising:

a first tablet portion containing a drug; and

a second tablet portion containing a fast dissolving agent, wherein the agent and drug are chemically compatible, wherein the first tablet portion and second tablet portion define a cavity for holding the electronic marker, and

wherein the electronic marker includes:

a non-conducting skirt that defines a central cavity;

a control unit positioned in the cavity defined by the skirt, wherein the control unit includes at least two dissimilar materials positioned to be separated by the skirt so that the dissimilar materials form a portion of a power source and represent a voltage potential and generate a current flow wherein the current flow is controlled by the control unit;

a coating to define a pocket that surrounds the skirt and control unit, wherein the coating dissolves away to expose the control unit to the surrounding environment.

[004c] In a third aspect of the present disclosure, there is provided a method for producing a pharmaceutical product with an integrated circuit (IC), the method comprising:

producing a pill;

securing the integrated circuit (IC) with an adhesive portion onto the pill to produce a tagged pill; and

protecting the tagged pill using a protective layer placed on top of the integrated circuit on the tagged pill to form the pharmaceutical product.

[005] The present ~~invention~~ disclosure provides a system and method for securing an ingestible electronic device to a pharmaceutical product without damaging the ingestible electronic device. The product includes an electronic marker placed on the product in accordance with one aspect of the present invention. In accordance with another aspect of the present invention, the electronic marker is placed inside the product. Various embodiments are disclosed in accordance with the present invention that allow for protection and coating of the electronic marker.