~~I Claim~~ **Claims**

1. A containment device comprising:

a first microchip element which comprises a containment reservoir that can be electrically activated to open; and

a first electronic printed circuit board (PCB) which comprises a biocompatible substrate, wherein the first PCB has a first side on which one or more electronic components are fixed and an opposed second side on which the ~~at least one~~ first microchip element is fixed in electrical connection to the one or more electronic components.

~~2. The containment device of claim 1, wherein the biocompatible substrate of the first PCB is a ceramic.~~

~~3. The containment device of claim 2, wherein the ceramic is alumina.~~

4~~2~~. The containment device of claim 1, wherein the first PCB comprises at least one via electrically connecting at least one of the one or more electronic components to the first microchip element.

5~~3~~. The containment device of claim 4~~2~~, wherein the at least one via is electrically connected to a metallized conductive surface on the second side of the first PCB, and the metallized conductive surface is wirebonded to the first microchip element.

~~6. The containment device of any one of claims 1 to 5, wherein the containment reservoir is a microreservoir which contains a drug formulation or a sensor element.~~

7~~4~~. The containment device of claim 1, further comprising:

a second electronic printed circuit board (PCB) which comprises a biocompatible substrate, wherein the second PCB has a first side on which one or more electronic components are fixed and an opposed second side; and

a housing ring securing the first PCB together with the second PCB,

wherein the first side of the first PCB is oriented in a facing relationship toward the first side of the second PCB.

8~~5~~. The containment device of claim 7~~4~~, wherein the biocompatible substrates of the first and second PCBs form the outer surfaces of the second sides of the first and second PCBs, respectively.

~~9~~6. The containment device of claim ~~8~~5, wherein the housing ring is formed of a biocompatible metal and hermetically seals the electronic components of the first and second PCBs within the housing ring.

~~10~~7. The containment device of ~~claim 9~~ any one of claims 1 to 6, wherein the biocompatible substrate of each of the first and second PCBs is ceramic.

~~11~~8. The containment device of ~~claim 10~~ any one of claims 1 to 7, wherein the ceramic is alumina.

~~12~~9. The containment device of claim ~~7~~4, wherein second side of the second PCB comprises an antenna.

~~13~~10. The containment device of claim ~~7~~4, wherein second side of the second PCB comprises a second microchip element which comprises a containment reservoir that can be electrically activated to open.

~~14~~11. The containment device of any one of claims ~~7~~1 to ~~13~~10, wherein the containment reservoir of the first microchip element or of the second microchip element is a microreservoir which contains a drug formulation or a sensor element.

~~15~~12. ~~A microchip device element comprising~~ The containment device of claim 1, wherein the first microchip element comprises:

a silicon substrate having a first side, an opposed second side, and at least one aperture extending therethrough, wherein the first side comprises an electrically conductive reservoir cap which closes off the at least one aperture;

a primary substrate which is formed of a polymer or a glass or other ceramic material, wherein the primary substrate has at least one reservoir which is defined by a closed end wall, an open end, and at least one sidewall extending between the closed end wall and the open end; and

reservoir contents positioned within the at least one reservoir,

wherein the second side of the silicon substrate is hermetically bonded to the primary substrate, such that the open end of the reservoir is in fluid communication with the at least one aperture for controlled release or exposure of reservoir contents.

~~16. The device of claim 15, wherein the primary substrate comprises a metal coating over at least a part of the polymer, glass or other ceramic material of the primary substrate.~~

~~17. The device of claim 16, wherein the metal coating coats the at least one sidewall and/or the closed end wall of the at least one reservoir.~~

~~18. The device of claim 15, wherein the second side of the silicon substrate comprises at least one ring structure formed thereon.~~

~~19. The device of claim 18, wherein the at least one ring structure comprises gold or another metal.~~

~~20. The device of claim 16, wherein the primary substrate comprises at least one groove structure, the at least one ring structure and the at least one groove structure together forming a hermetic bond.~~

~~21. The device of claim 20, wherein the surface of the primary substrate in and/or adjacent to the at least one groove structure comprises a metal coating.~~

~~22. The device of claim 21, wherein the metal coating comprises gold.~~

~~23. A method of making a microchip device element comprising:~~

~~microfabricating a silicon substrate having a first side, an opposed second side, and at least one aperture extending therethrough, wherein the first side comprises an electrically conductive reservoir cap which closes off the at least one aperture;~~

~~casting or molding a polymer or a glass or other ceramic material to form a primary substrate having at least one reservoir which is defined by a closed end wall, an open end, and at least one sidewall extending between the closed end wall and the open end;~~

~~providing reservoir contents within the at least one reservoir; and~~

~~bonding the silicon substrate to the primary substrate such that the open end of the reservoir is in fluid communication with the at least one aperture.~~

~~24. The method of claim 23, wherein the microfabricating step further includes forming at least one ring structure on the second side of the silicon substrate.~~

~~25. The method of claim 24, wherein the primary substrate comprises at least one groove structure and the step of bonding comprises compression cold welding the at least one ring structure together with the at least one groove structure.~~

~~26~~13. A method of assembling a containment device comprising:

providing a first microchip element which comprises a containment reservoir that can be electrically activated to open;

fixing the first microchip element to a first side of a first electronic printed circuit board (PCB) which comprises a biocompatible substrate; and

electrically connecting the first microchip element to one or more electronic components which are fixed on a second side of the first PCB.

~~27~~14. The method of claim ~~26~~13, wherein the step of electrically connecting comprises wirebonding.

~~28. The method of claim 26, wherein the biocompatible substrate of the first PCB is a ceramic.~~

~~29. The method of claim 28, wherein the ceramic is alumina.~~

~~30~~15. The method of claim ~~26~~13, wherein the first PCB comprises at least one via electrically connecting at least one of the one or more electronic components to the first microchip element.

~~31~~16. The method of claim ~~26~~15, wherein the at least one via is electrically connected to a metallized conductive surface on the second side of the first PCB, and the metallized conductive surface is wirebonded to the first microchip element.

~~32~~17. The method of any one of claims ~~26~~13 to ~~31~~16, further comprising:

providing a second electronic printed circuit board (PCB) which comprises a biocompatible substrate, wherein the second PCB has a first side on which one or more electronic components are fixed and an opposed second side; and

securing a housing ring to the first PCB and to the second PCB with the first side of the first PCB oriented facing toward the first side of the second PCB.

~~33~~18. The method of ~~claim 32~~ any one of claims 13 to 17, wherein the containment reservoir is a microreservoir which contains a drug formulation or a sensor element.