Claims

1. A balloon inflating device comprising:

a balloon;

a first substance within the balloon;

a second substance within the balloon capable of having a reaction with the first substance to generate a gas within the balloon to inflate the balloon; ~~and~~

an electrical activator configured to activate the reaction between the first and second substances;

a controller configured to control the electrical activator; and

a separator configured to separate the first substance from the second substance,

wherein the separator can be activated by the electrical activator to allow the contact between the first and second substances,

wherein the electrical activator comprises a biasing member torsioned and attached to the separator and a heating point configured to heat the biasing member, wherein the heating point is configured to, when activated electrically, heat the biasing member and release the biasing member thus releasing the separator to allow contact between the first and second substances.

~~2. The device as claimed in claim 1 further comprising a controller configured to control the electrical activat~~

~~3~~2. The device as claimed in claim 1 ~~or 2~~ further comprising a receiver connected to the controller, the receiver configured to receive a remote signal and sending the signal to the controller.

~~4. The device as claimed in any one of preceding claims 1 to 3 wherein the electrical activator comprises a syringe having a plunger and an actuator configured to drive the plunger wherein the syringe contains the first substance and the actuator is configured to, when activated electrically, drive the plunger and actuates the first substance to contact the second substance.~~

~~5. The device as claimed in claim 4 wherein the actuator comprising a stopper and a resilient member held compressed by the stopper wherein the stopper is configured to, when activated electrically, release the resilient member to drive the plunger.~~

~~6. The device as claimed in any one of claims 1 to 5 further comprising a separator configured to separate the first substance from the second substance wherein the separator can be activated by the electrical activator to allow the contact between the first and second substances.7. The device as claimed in claim 6 wherein the electrical activator comprises a~~

~~biasing member torsioned and attached to the separator and a heating point configured to heat the biasing member wherein the heating point is configured to, when activated electrically, heats the biasing member and releases the biasing member thus releases the separator to allow contact between the first and second substances.~~

~~8~~3. The device as claimed in claim ~~7~~ 1 further comprising a press-fit cover wherein releasing the biasing member releases the press-fit cover and separator.

~~9. The device as claimed in claim 6 wherein electrical activator comprises electrodes, wherein separator is in electrical contact with and between the electrodes, wherein the electrodes are configured to, when activated electrically, allow the first substance to permeate the separator to contact the second substance.~~

~~10. The device as claimed in claim 8 or 9 wherein the electrical activator comprises a heating element wherein the heating element is configured to, when activated electrically, melt the separator to allow the first substance to contact the second substance.~~

~~11~~4. The device as claimed in ~~any one of~~ claim~~s 6 to 10~~1, wherein the separator includes a membrane.

~~12. The device as claimed in any one of the preceding claims wherein the electrical activator comprises an energy source wherein the energy source, when activated electrically, energizes the first and second substances to react with each other.~~

~~13~~5. The device as claimed in any one of the preceding claims further comprising a dissolvable substance configured to retain the balloon in a compressed configuration.

~~14~~6. The device as claimed in claim 13 wherein the dissolvable substance is a coating wherein the coating is coated onto the balloon.

~~15~~7. The device as claimed in any one of the preceding claims further comprising a casing for containing the controller and the receiver.

~~16~~8. The device as claimed in any one of the preceding claims further comprising a valve configured to release the gas from the balloon.

~~17~~9. The device as claimed in any one of the preceding claims further comprising a heater in communication with the controller configured to heat the balloon wherein the heater is capable of heating the balloon and puncturing it to release the gas from the balloon.

~~18~~10. The device as claimed in any one of the preceding claims, wherein the balloon comprises a material which degenerates over a predetermined time period when exposed to an acid.

~~19~~11. The device as claimed in any one of ~~the preceding claims~~claims 1 to 7, wherein the balloon comprises a heat source, a shape memory alloy in thermal contact with the heat source configured to distort with the balloon from an original shape when the balloon is inflated wherein the balloon is returned to the original shape when the shape memory alloy is heated.

~~20~~12. The device as claimed in any one of the preceding claims further comprising any one or ~~more of the following: a~~ a combination of a temperature sensor, a humidity sensor, an acidity sensor, a pressure sensor and a positioning sensor.

~~21~~13. The device as claimed in any one of the preceding claims, wherein the first substance is a bicarbonate and the second substance is an acid capable of reacting with the bicarbonate to generate the gas.

~~22~~14. The device as claimed in any one of the preceding claims, wherein the balloon comprises a multi-layered membrane.

~~23~~15. The device as claimed in claim ~~22~~ 14, wherein the multi-layered membrane comprises a layer of plastic film and a layer of rubber.

~~24~~16. The device as claimed in claim ~~23~~ 15, wherein the layer of plastic film has a thickness less~~er~~ than 30 microns.

~~25~~17. The device as claimed in any one of the preceding claims, wherein the balloon comprises a radio-opaque substance.

~~26. The device as claimed in claim 4 further comprising a channel configured to release the gas, the channel comprising an opening wherein the plunger when retracted exposes the opening to allow the gas to be released through the channel.~~

~~27~~18. The device as claimed in any one of the preceding claims further comprising a timer configured to activate the reaction between the first and second substances at a predetermined time.

~~28~~19. The device as claimed in ~~any one of~~ claim~~s 15~~ 7, wherein the casing is made of an organic thermoplastic.

~~29~~20. The device as claimed in claim ~~28~~ 19, wherein the organic thermoplastic is Polyether Ether Ketone.

~~30~~21. A method for inflating a balloon comprising:
providing a first substance within the balloon;
providing a second substance within the balloon; and
activating a reaction between the first and second substances electrically to generate a gas within the balloon to inflate the balloon,
wherein activating the reaction electrically comprises activating a separator to allow the contact between the first and second substances by heating a torsioned biasing member attached to the separator to release the biasing member thereby releasing the separator to allow contact between the first and second substances,
wherein the separator comprises a press-fit cover.

~~31~~22. The method as claimed in claim ~~30~~ 21 further comprising controlling the activating of the reaction between the first and second substances.

~~32~~23. The method as claimed in ~~any one of~~ claim~~s 30 to 31~~21 further comprising receiving a remote signal and sending the signal to control the reaction.

~~33. The method as claimed in any one of claims 30 to 32 further comprising driving a plunger in a syringe containing the first substance and actuating the first substance to contact the second substance.~~

~~34. The method as claimed in claim 30 comprising electrically activating a stopper to release a compressed resilient member and releasing the resilient member to drive the plunger.35. The method as claimed in any one of claims 30 to 34 wherein activating the reaction electrically comprises activating a separator to allow the contact between the first and second substances.~~

~~36. The method as claimed in claim 35 further comprising heating a torsioned biasing member attached to the separator, releasing the biasing member and releasing the separator to~~

~~allow contact between the first and second substances.37. The method as claimed in claim 35 further comprising heating a torsioned biasing member attached to a press fit cover, releasing the biasing member and releasing the press fit cover and separator to allow contact between the first and second substances38. The method as claimed in any one of claims 35 to 37 wherein activating the reaction electrically comprises activating the separator electrically and allowing the first substance to permeate the separator to contact the second substance.39. The method as claimed in any one of claims 35 to 38 further comprising heating a heating element and melting the separator to allow the first substance to contact the second substance40. The method as claimed in any one of claims 30 to 39 further comprising energizing the first and second substances to react with each other.~~

~~41~~24. The method as claimed in ~~any one of~~ claim~~s 30 to 40~~21 ~~further~~ comprising dissolving a dissolvable substance to release the balloon.

~~42~~25. The method as claimed in claim ~~41~~24, wherein dissolving the dissolvable substance comprising dissolving a coating coated onto the balloon.

~~43~~26. The method as claimed in ~~any one of~~ claim~~s 30 to 42~~21 further comprising releasing the gas from the balloon through a valve.

~~44~~27. The method as claimed in ~~any one of~~ claim~~s 30 to 43~~21 further comprising heating a heater and puncturing the balloon to release the gas.

~~45~~28. The method as claimed in ~~any one of~~ claim~~s 30 to 44~~21 further comprising exposing the balloon to an acid and degenerating the balloon over a predetermined time.

~~46~~29. The method as claimed in ~~any one of~~ claim~~s 30 to 45~~21 further comprising heating a shape memory alloy to return to an original shape.

~~47. The method as claimed in any one of claims 30 to 46 further comprising one or more of the following: sensing temperature, sensing humidity, sensing acidity, sensing pressure and sensing position.~~

~~48~~30. The method as claimed in ~~any one of~~ claim~~s 30 to 47~~21, wherein ~~providing a~~the first substance ~~comprises providing~~is a bicarbonate and ~~providing a~~the second substance ~~comprises providing~~is an acid capable of reacting with the bicarbonate to generate the gas.

~~49. The method as claimed in any one of claims 30 to 48 further comprising retracting the plunger to expose a channel and channeling the gas.~~

~~50. The method as claimed in any one of claims 30 to 49 further comprising determining a time period and activating the reaction after the time period.~~

31. A balloon inflating and deflating system comprising:

a balloon;

a first substance within the balloon;

a second substance within the balloon capable of having a reaction with the first substance to generate a gas within the balloon to inflate the balloon, wherein the first substance is acid in aqueous solution and the second substance is a bicarbonate;

an electrical activator configured to activate the reaction between the first and second substances; and

a controller configured to control the electrical activator,

wherein the electrical activator comprises a syringe having a plunger and an actuator configured to drive the plunger wherein the syringe contains the first substance and the actuator is configured to, when activated electrically, drive the plunger and actuate the first substance to contact the second substance,

wherein the plunger comprises an opening connecting to a channel to release the gas and the opening is exposed to the gas when the plunger is retracted.

32. The device as claimed in claim 4 wherein the actuator comprises a stopper and a resilient member held compressed by the stopper, wherein the stopper is configured to, when activated electrically, release the resilient member to drive the plunger.