Claims

1. A computing device comprising:

an outer covering having at least a first portion which is an oxygen-permeable microstructure, wherein the first portion is integrally formed with the outer covering;

an electronic component within the outer covering; and

a fuel cell with an oxidant inlet that is in fluid communication with the first portion of the outer covering.

2. The computing device of claim 1, wherein the first portion of the outer covering provides a structural support to the electronic component or the fuel cell.

3. The computing device of claim1 or claim 2, wherein the first portion of the outer covering provides mechanical protection to the electronic component or the fuel cell.

4. The computing device of claim 2 or claim 3, wherein the first portion of the outer covering is rigid.

5. The computing device of any preceding claim, wherein the outer covering has a second portion which is a microstructure that provides a lower oxygen permeability than the first portion, wherein the second portion is integrally formed with the outer covering.

6. The computing device of claim 5, wherein the second portion has a substantially non-oxygen-permeable microstructure.

7. The computing device of any preceding claim, wherein the outer covering has no visible apertures.

8. The computing device of any preceding claim, wherein the outer covering is a unitary structure.

9. The computing device of any preceding claim, wherein the oxygen-permeable microstructure of the first portion comprises pores or apertures with a mean length less than one of 0.1, 0.5, 1, 2, 5, 10 or 20 microns in their longest dimension in a plane of the exterior surface of the covering.

10. The computing device of claim 6, wherein the pores or apertures are arranged in an ordered pattern.

11. The computing device of any preceding claim, wherein the outer covering comprises one or more of: a porous sintered material; carbon fibre; metallised porous plastic; pierced metallic material; a metal or alloy; porous graphite; woven metallic fibre; metallised porous glass; stainless steel; aluminium possibly with protective coating; a plastic; carbon fibre; a composite material; porous glass; a ceramic; or metallic coated materials.

12. The computing device of any preceding claim, wherein the oxidant inlet of the fuel cell is provided on an oxidant inlet face of the fuel cell, and wherein the oxidant inlet face of the fuel cell is integrated with the first portion of the outer covering.

13. The computing device of any preceding claim, further comprising a fan configured to direct air through the first portion of the outer covering into the oxidant inlet of the fuel cell.

14. The computing device of claim 13, further comprising a first fluid flow path and a second fluid flow path, wherein the first fluid flow path is provided between the fan and the electronic component, the second fluid flow path is provided between the fan and the oxidant inlet of the fuel cell, and wherein the fan is configured to direct air into the first and second fluid flow paths.

15. The computing device of claim 14, wherein the outer covering is in thermal contact with the fuel cell or the electronic component and is configured to conduct heat from the fuel cell or the electronic component so as to maintain a suitable operating temperature of the device.

16. The computing device of claims 13 to 15, further wherein the fan is situated between the first portion of the outer covering and the oxidant inlet.

17. The computing device of any preceding claim, wherein the first portion of the outer covering comprises a chemical filter.

18. The computing device of any preceding claim, wherein the first portion of the outer covering is configured to filter, from an air stream passing between an exterior of

the outer covering and the oxidant inlet of the fuel cell, at least one of: aromatic compounds; hydrocarbons; carbon monoxide; sulphur compounds; volatile organic compounds (VOCs); oxides of nitrogen and particulate matter.

19. The computing device of any preceding claim, wherein the fuel cell is a fuel cell stack and the first portion of the outer covering provides a compression plate of the fuel cell stack.

20. The computing device of any preceding claim, wherein the outer covering has a hydrophilic core configured to wick water from the fuel cell and a hydrophobic coating to prevent water ingress into the device.

21. A computing device comprising:

an outer covering comprising a material having:

a first portion having an oxygen-permeable microstructure, and

a second portion having a microstructure that is substantially non-oxygen-permeable; and

a fuel cell with an oxidant inlet that is in fluid communication with the first portion of the outer covering.

Claims

1. A computing device comprising:

an outer covering having at least a first portion which is an oxygen-permeable microstructure, wherein the first portion is integrally formed with the outer covering;

an electronic component within the outer covering; and

a fuel cell with an oxidant inlet that is in fluid communication with the first portion of the outer covering.

2. The computing device of claim 1, wherein the first portion of the outer covering provides a structural support to the electronic component or the fuel cell.

3. The computing device of claim1 or claim 2, wherein the first portion of the outer covering provides mechanical protection to the electronic component or the fuel cell.

4. The computing device of claim 2 or claim 3, wherein the first portion of the outer covering is rigid.

5. The computing device of any preceding claim, wherein the outer covering has a second portion which is a microstructure that provides a lower oxygen permeability than the first portion, the oxygen permeability of the second portion being less than 0.1%, 1%, 10% or 25% of the oxygen permeability of the first portion, wherein the second portion is integrally formed with the outer covering.

6. The computing device of claim 5, wherein the second portion has a non-oxygen-permeable microstructure.

7. The computing device of any preceding claim, wherein the outer covering has no visible apertures.

8. The computing device of any preceding claim, wherein the outer covering is a unitary structure.

9. The computing device of any preceding claim, wherein the oxygen-permeable microstructure of the first portion comprises pores or apertures with a mean length less than one of 0.1, 0.5, 1, 2, 5, 10 or 20 microns in their longest dimension in a plane of the exterior surface of the covering.

10. The computing device of claim 6, wherein the pores or apertures are arranged in an ordered pattern.

11. The computing device of any preceding claim, wherein the outer covering comprises one or more of: a porous sintered material; carbon fibre; metallised porous plastic; pierced metallic material; a metal or alloy; porous graphite; woven metallic fibre; metallised porous glass; stainless steel; aluminium possibly with protective coating; a plastic; carbon fibre; a composite material; porous glass; a ceramic; or metallic coated materials.

12. The computing device of any preceding claim, wherein the oxidant inlet of the fuel cell is provided on an oxidant inlet face of the fuel cell, and wherein the oxidant inlet face of the fuel cell is integrated with the first portion of the outer covering.

13. The computing device of any preceding claim, further comprising a fan configured to direct air through the first portion of the outer covering into the oxidant inlet of the fuel cell.

14. The computing device of claim 13, further comprising a first fluid flow path and a second fluid flow path, wherein the first fluid flow path is provided between the fan and the electronic component, the second fluid flow path is provided between the fan and the oxidant inlet of the fuel cell, and wherein the fan is configured to direct air into the first and second fluid flow paths.

15. The computing device of claim 14, wherein the outer covering is in thermal contact with the fuel cell or the electronic component and is configured to conduct heat from the fuel cell or the electronic component so as to maintain a suitable operating temperature of the device.

16. The computing device of claims 13 to 15, further wherein the fan is situated between the first portion of the outer covering and the oxidant inlet.

17. The computing device of any preceding claim, wherein the first portion of the outer covering comprises a chemical filter.

18. The computing device of any preceding claim, wherein the first portion of the outer covering is configured to filter, from an air stream passing between an exterior of the outer covering and the oxidant inlet of the fuel cell, at least one of: aromatic compounds; hydrocarbons; carbon monoxide; sulphur compounds; volatile organic compounds (VOCs); oxides of nitrogen and particulate matter.

19. The computing device of any preceding claim, wherein the fuel cell is a fuel cell stack and the first portion of the outer covering provides a compression plate of the fuel cell stack.

20. The computing device of any preceding claim, wherein the outer covering has a hydrophilic core configured to wick water from the fuel cell and a hydrophobic coating to prevent water ingress into the device.

21. A computing device comprising:

an outer covering comprising a material having:

a first portion having an oxygen-permeable microstructure, and

a second portion having a microstructure that is non-oxygen-permeable; and

a fuel cell with an oxidant inlet that is in fluid communication with the first portion of the outer covering.