CLAIMS

1. A patient interface for use with a respiratory support apparatus for delivering breathable gases to a patient, the patient interface comprising;
    a. a cushion at least partially defining an internal cavity, the cushion comprising a pair of opposing cushion side walls and a sealing flange arranged to seal against the face of the patient;
    b. a gases inlet in fluid communication with the internal cavity;
    c. a tether;

    wherein the tether extends substantially laterally across the cushion inside the internal cavity between the pair of opposing cushion side walls, the tether being mounted to the cushion side walls, and being spaced from the face of the patient.
2. The patient interface of claim 1 wherein the tether is integral with the cushion.
3. The patient interface of claim 1 wherein the tether and cushion are separate components.
4. The patient interface of claim 3 comprising a pair of laterally spaced mounts on the cushion, the tether being secured to the cushion by the laterally spaced apart mounts.
5. The patient interface of any one of the preceding claims wherein the cushion side walls are laterally spaced by a predetermined distance, the tether being configured to substantially maintain the predetermined distance.
6. The patient interface of any one of the preceding claims wherein the tether is configured to resist laterally outward movement of the cushion side walls.
7. The patient interface of any one of the preceding claims wherein the tether is configured to allow laterally inward movement of the cushion side walls.
8. The patient interface of any one of the preceding claims wherein the tether is inextensible under tensile forces.
9. The patient interface of any one of the preceding claims wherein the tether is collapsible under compressive forces.
10. The patient interface of any one of the preceding claims wherein the tether is inelastic.

11. The patient interface of any one of the preceding claims wherein the tether and the cushion side walls are configured such that the tether extends across, but is spaced from, the upper lip region of the patient.
12. The patient interface of any one of the preceding claims wherein the cushion comprises a nasal bridge region and the tether is positioned below the nasal bridge region.
13. The patient interface of any one of the preceding claims wherein the cushion comprises a pair of side of nose portions and the tether is positioned below the side of nose portions.
14. The patient interface of claim 13 wherein the side of nose portions are provided on, or comprise part of, the cushion side walls.
15. The patient interface of any one of the preceding claims wherein the tether is rigid, or at least comprises a rigid portion.
16. The patient interface of any one of the preceding claims wherein the tether comprises any one or more of:
    a. a filament;
    b. a wire;
    c. one or more fibres;
    d. a ribbon;
    e. string;
    f. a braided element.
17. The patient interface of any one of the preceding claims wherein the tether is formed from any one or more of:
    a. plastic;
    b. metal;
    c. silicone;
    d. a woven material;
    e. a knitted material;
    f. a braided material.
18. The patient interface of any of the preceding claims wherein the tether comprises a circular or elliptical transverse cross section.
19. The patient interface of any one of the preceding claims wherein the tether comprises a non-circular transverse cross section.

20. The patient interface of any one of the preceding claims wherein the tether comprises a central portion between two tether side portions, the central portion being configured to be mounted to a central mount of the cushion.
21. The patient interface of claim 20 wherein each tether side portion extends across the cushion from a respective lateral mount to the central mount, such that each tether side portion can move independently of the other.
22. The patient interface of claim 20 or 21 wherein the central portion is rigid.
23. The patient interface of any one of claims 20 to 22 wherein the central portion is arcuate.
24. The patient interface of any one of claims 20 to 23 wherein the central portion comprises one of a lug and a slot, the cushion comprising the other of the lug and the slot, the lug being configured to be received in the slot to mount the central portion of the tether to the cushion.
25. The patient interface of claim 24 wherein the lug is received in and projects through the slot.
26. The patient interface of claim 24 or claim 25 wherein the slot is provided on the tether.
27. The patient interface of any one of claims 24 to 26 wherein the slot is elongate.
28. The patient interface of any one of claims 24 to 27 wherein the slot is elliptical.
29. The patient interface of any one of claims 20 to 28 wherein the tether comprises a front tether portion, the tether central portion being mounted to the cushion via the front tether portion, the front tether portion extending from the central portion to a front wall of the cushion.
30. The patient interface of claim 29 wherein the front tether portion is flexible.
31. The patient interface of claim 29 or 30 wherein the front and/or side tether portions are secured to the tether central portion by any one or more of:
    a. Knots.
    b. Adhesive.
    c. Overmoulding.
    d. Welding.
32. The patient interface of any one of claims 20 to 31 wherein the tether central portion comprises a widened support region which engages the central mount of the cushion.

33. The patient interface of any one of claims 20 to 32 wherein the central mount engages the tether at an upper lip contacting region of the cushion.
34. The patient interface of any one of the preceding claims wherein the tether is of non-uniform thickness, and/or shape, and/or transverse cross section, along its length.
35. The patient interface of claim 34 comprising at least one thinned region, the thinned region having a thinner transverse cross section than an adjacent region of the tether.
36. The patient interface of claim 35 comprising a plurality of thinned regions.
37. The patient interface of claim 36 wherein the thinned regions are equispaced along the length of the tether.
38. The patient interface of claim 36 or 37 comprising between two and ten thinned regions, preferably between three and eight, and in some examples six thinned regions.
39. The patient interface of claim 35 wherein the tether comprises the same number of thinned regions in each portion of the tether that extends between the central mount and respective lateral mounts.
40. The patient interface of any one of claims 34 to 39 wherein the or each thinned region comprises a living hinge.
41. The patient interface of any one of claims 34 to 40 wherein the or each thinned region has a thickness that is between 25 and 75% of the thickness of the tether, preferably between 35 and 65%, and in some examples is about 50%.
42. The patient interface of any one of claims 34 to 41, wherein the tether comprises a central portion between two end portions, the two end portions having a larger thickness and/or transverse cross sectional area than that of the central portion.
43. The patient interface of claim 4 wherein each laterally spaced mount comprises a respective aperture in the cushion, the tether comprising opposed ends, each opposed end projecting through a respective aperture.
44. The patient interface of any one of the preceding claims wherein each end of the tether comprises a restraining component configured to resist the opposed ends being pulled through the respective apertures, under tensile load applied to the tether.

45. The patient interface of claim 44 wherein each restraining component comprises a side support, secured to the tether, and configured to extend over a respective side wall of the cushion.

46. The patient interface of claim 45 wherein each side support is elongate, having a longitudinal axis which is not aligned with the longitudinal axis of the tether.

47. The patient interface of claim 46 wherein each side support is elongate, having a longitudinal axis which is inclined to the longitudinal axis of the tether.

48. The patient interface of claim 46 wherein the longitudinal axis of each side support extends along the cushion side wall.

49. The patient interface of claim 47 wherein each side support extends downwardly from an upper portion of the cushion.

50. The patient interface of claim 45 wherein each side support extends from a position at or adjacent a top margin of the cushion.

51. The patient interface of claim 46 wherein each side support extends substantially above and below the longitudinal axis of the tether.

52. The patient interface of any one of claims 44 to 51 wherein each side support comprises an enlarged portion configured to transfer load from the tether to the side support.

53. The patient interface of claim 52 wherein the enlarged portion of each side support is substantially planar, or comprises at least a substantially planar portion, such that load transferred from the tether to the side supports is distributed across the cushion side walls.

54. The patient interface of any one of claims 35 to 53 wherein each side support is arcuate, or comprises at least an arcuate portion.

55. The patient interface of any one of claims 35 to 54 wherein each side support comprise a shape, and/or profile that is complimentary to the shape and/or profile of the region of the cushion side walls on which the side supports are located.

56. The patient interface of claim 55 wherein an outer surface of each side support is flush with an outer surface of the region of the cushion side walls on which the side supports are located.

57. The patient interface any one of claims 35 to 56 wherein each cushion side wall comprises a recess configured to receive and locate a respective side support.

58. The patient interface of any one of claims 35 to 57 wherein each side support is more rigid than the cushion.

59. ~~The patient interface of any one of claims 35 to 58 wherein each side support comprises a mounting post, the mounting posts extending through a respective aperture in the cushion side wall so as to project into the interior of the cushion.~~
60. ~~The patient interface of claim 59 wherein each mounting post terminates in an enlarged portion, the enlarged portion engaging an interior surface of the cushion side walls to resist removal of the mounting post from the cushion.~~
61. ~~The patient interface of claim 60 wherein each enlarged portion is oblong, when viewed along a longitudinal axis of the mounting post.~~
62. ~~The patient interface of any one of claims 60 to 61, wherein the part of each mounting post that extends through the aperture in the cushion is of substantially constant cross section.~~
63. ~~The patient interface of any one of claims 60 to 61, wherein the part of each mounting post that extends through the aperture in the cushion is of varying cross section.~~
64. ~~The patient interface of claim 63, wherein the cross section of the part of each mounting post that extends through the aperture in the cushion increases as it extends into cushion.~~
65. ~~The patient interface of claim 64 wherein the mounting post comprises an outer end having a relatively small cross section, and an inner end having a relatively large cross section, wherein the inner end comprises the enlarged portion of the mounting post.~~
66. ~~The patient interface of claim 65 wherein the enlarged portion is flush with the inner surface of the cushion.~~