despite the collar being in the 'closed' position, a connection may not have been correctly made and no particular feedback (haptic, tactile or otherwise) may be given to the operator to otherwise assist with a correct connection being made or for even assisting with ensuring a correction is more likely to be made.

SUMMARY OF INVENTION

[0006] It is an object of certain embodiments disclosed herein to provide a connector for use in a medical breathing circuit or respiratory support system that will at least go some way towards improving on the above or which will at least provide the public or the medical profession with a useful choice. It is an alternative or additional object of certain embodiments disclosed herein to provide a connector for use at a terminal end of a medical breathing conduit that enables a releasable yet secure connection to be made with another component.

[0007] Humidified gases can be used to allow for comfortable gases delivery to a patient in some configurations. Humidity prevents the airways from drying out and hence can prevent or minimise damage to the airways and may also improve or assist with maintaining patient comfort when receiving a flow of gases being delivered to their airway(s).

[0008] In a first aspect, there is provided a connector for a component of a medical breathing circuit, the connector configured to connect with a second connector, the connector comprising: an inner body and an outer body, the inner body housing an electrical connection, the outer body configured to be slidable along the inner body between each of an inoperative orientation and an operative orientation with respect to the inner body, the outer body and the inner body being in engagement or in an operative association with each other when the outer body is provided in the operative orientation, and the outer body and the inner body being disengaged from each other or in an inoperative association with each other when the outer body is provided in the inoperative orientation, wherein a surface of the inner body comprises one or more surface relief feature(s) providing for a resistance to the outer body being moved from the inoperative orientation to the operative orientation and allowing the inner body and the outer body to move together toward the second connector, and wherein the inner body further comprises at least one connection feature configured to retain the connector in connection with the second connector, and one or more latch members, wherein an outside surface of one or each of said one or more latch member(s) comprises at least one of said one or more surface relief feature(s),

wherein the latch member(s) is/are configured to deflect inwardly relative to a remainder of the inner body as the outer body moves from the inoperative orientation to the operative orientation, and wherein the outer body is configured to overcome the resistance and house the connection feature of the inner body in the operative orientation.

[0009] At least one or each of a surface of the inner body or a surface of the outer body may comprise a surface relief feature(s) that provide(s) for a first resistance to a force of displacement of the outer body being slidably moved from the

CLAIMS

1. A connector for a component of a medical breathing circuit, the connector configured to connect with a second connector, the connector comprising:

an inner body and an outer body, the inner body housing an electrical connection,

the outer body configured to be slidable along the inner body between each of an inoperative orientation and an operative orientation with respect to the inner body,

the outer body and the inner body being in engagement or in an operative association with each other when the outer body is provided in the operative orientation, and

the outer body and the inner body being disengaged from each other or in an inoperative association with each other when the outer body is provided in the inoperative orientation,

wherein a surface of the inner body comprises one or more surface relief feature(s) providing for a resistance to the outer body being moved from the inoperative orientation to the operative orientation and allowing the inner body and the outer body to move together toward the second connector,

and wherein the inner body further comprises:

at least one connection feature configured to retain the connector in connection with the second connector, and

one or more latch members, wherein an outside surface of one or each of said one or more latch member(s) comprises at least one of said one or more surface relief feature(s), wherein the latch member(s) is/are configured to deflect inwardly relative to a remainder of the inner body as the outer body moves from the inoperative orientation to the operative orientation, and

wherein the outer body is configured to overcome the resistance and house the connection feature of the inner body in the operative orientation.

2. The connector as claimed in claim 1, wherein at least one or each of a surface of the inner body or a surface of the outer body comprises said one or more surface relief feature(s) that provide(s) for a first resistance to a force of displacement of the

outer body being slidably moved from the inoperative orientation toward the operative orientation, and wherein the force of displacement required to overcome the first resistance is greater than a force of displacement subsequently required to complete the outer body being slidably moved to the operative orientation.

3. The connector as claimed in claim 1 or 2, wherein the connector is configured such that a force required to engage the inner body with the second connector is less than a force required to move the outer body from the inoperative orientation to the operative orientation.

4. The connector as claimed in any one of claims 1-3, wherein a force required to move the outer body from the inoperative orientation to the operative orientation when said inner body is in an engagement with the second connector, is less than a force required to move the outer body from the inoperative orientation to the operative orientation when said inner body is out of an engagement with a connection feature of a second connector.

5. The connector as claimed in any one of claims 1-4, wherein when said inner body of the connector is in an engagement with the second connector, a force required to move the outer body from the inoperative orientation to the operative orientation is less than about 50 Newtons, optionally is about 30 Newtons, and/or when said inner body of the connector is out of an engagement with the second connector, a force required to move the outer body from the inoperative orientation to the operative orientation is greater than about 50 Newtons, optionally is about 100 Newtons.

6. The connector of any one of claims 1-5, wherein the at least one connection feature of said inner body of the connector is one or more of:

a raised tab or protrusion (optionally the raised tab extends substantially radially inwardly) to be received by a connection feature of the second connector when aligned for engagement (optionally to be received by a recess of the second connector),

a recess configured for receipt of a connection feature of the second connector when aligned for engagement (optionally to be received by a recess of the second connector).

7. The connector of any one of claims 1-6, wherein the outer body of the connector when in the operative orientation is configured to maintain or secure the at least one connection feature of the connector in a retained orientation relative to the second connector.

8. The connector of any one of claims 1 to 7, wherein at least one of said one or more latch members comprise said at least one connection feature configured to retain the inner body relative to the second connector.

9. The connector of any one of claim 1 to 8, wherein at least one of said one or more surface relief feature(s) is a protrusion or a raised profile that extends outwardly from said outside surface.

10. The connector of claim 9, wherein said at least one of said one or more surface relief feature(s) is a protrusion or raised profile positioned or located substantially a predetermined length from an end of a said latch member, said end being the end of the latch member toward which said outer body is moved toward the operative orientation.

11. The connector of claim 9 or 10, wherein said at least one of said one or more surface relief feature(s) is a protrusion or raised profile, wherein said protrusion or raised profile has a ramped face, said ramped face inclining at an angle from the outer surface of the latch member to a radially outward point, and optionally being inclined in a direction toward said end of a latch member (optionally said end being the end of the latch member toward which said outer body is moved toward the operative orientation).

12. The connector of any one of claims 1-11, wherein said surface relief feature on the outside surface of a said latch member interferes with, or is contacted by, a surface of the outer body when said outer body is moved in a direction from the inoperative orientation to the operative orientation.

13. The connector of any one of claims 1-12, wherein an inside surface of the outer body comprises said one or more surface relief feature(s), a leading edge or face of which are configured to make an initial interference or contact with a said surface relief feature provided on an outside surface of said inner body or a said latch member when said outer body is moved in a direction from the inoperative orientation to the operative orientation.

14. The connector of any one of claims 1 to 13, comprising:

a female connector portion, wherein the female connector portion comprises:

the inner body and the outer body, the outer body configured to be in a slidable relationship with the inner body, and

wherein at least one, or both of, an outside surface of the inner body and an inside surface of the outer body, comprise said one or more surface relief feature(s).

15. A connector assembly comprising:

a first connector as claimed in any one of claims 1-14, and

a second connector comprising at least one connection feature, the at least one connection feature of the first connector being configured to engage with the at least one connection feature of the second connector to retain the first connector in connection with the second connector.

16. The connector assembly of claim 15, wherein the outer body when in the operative orientation is configured to maintain or secure the at least one connection feature in a retained orientation relative to a said second connector.

17. The connector assembly of claim 15 or 16, wherein the at least one connection feature of said second connector is one or more of:

a raised tab or protrusion to be received by a connection feature of the first said connector when aligned for engagement (optionally to be received by a recess of the first connector),

a recess configured for receipt of a connection feature of the first connector when aligned for engagement (optionally to be received by a recess of the first connector).

18. The connector assembly of claim 16 or 17, wherein a force required to move the outer body to the operative orientation when the at least one connection feature of the first connector is aligned for an engagement into a retained orientation with connection features of the second connector is less than a force required to move the outer body to the operative orientation when the at least one connection feature of the first connector is out of alignment for an engagement into a retained orientation with connection features of the second connector.

19. The connector assembly of any one of claims 16-18, wherein a force required to move the outer body to the operative orientation when the at least one connection feature of the first connector and at least one connection feature of the second connector are aligned for an engagement with each other into a retained orientation is less than about 50 Newtons, optionally is less than about 30 Newtons, and/or wherein a force required to move the outer body to the operative orientation when

the first connector and the second connector are attached to each other yet the at least one connection feature of the first connector and at least one connection feature of the second connector are out of an alignment for an engagement with each other into a retained orientation is greater than about 50 Newtons, optionally is about 100 Newtons.

20. The connector assembly of any one of claims 16-19, wherein the inner body of the first connector comprises one or more latch members, optionally said latch member is a deflectable portion of the inner body (optionally said latch member being deflectable substantially radially inwardly toward a connection feature of the second connector to which said latch member is to be engaged thereto when said outer body is moved into the operative orientation).