

NASAL CANNULA SYSTEM

BACKGROUND

Field

[0001] The disclosure relates to respiratory support systems, nasal cannula systems, nasal cannula assemblies, nasal cannulae, nasal cannula components (e.g., nasal prong modules and frames), and their methods for use. Particularly, but not exclusively, the disclosure relates to a modular nasal cannula.

Related Art

[0002] High flow therapy (HFT) is a form of respiratory support. It may be used to treat patients suffering from a respiratory condition such as chronic obstructive pulmonary disease (COPD), pneumonia, coronavirus, or congestive heart failure, for example. Symptoms of the respiratory condition may comprise one or more of a high respiratory rate, dyspnea, high work of breathing, low oxygen saturation (SpO_2), or high partial pressure of carbon dioxide (PaCO_2).

[0003] During HFT, a flow of a respiratory gas or a mixture of respiratory gases (collectively referred to below as a flow of respiratory gases, for convenience) is delivered to the patient. Usually at a relatively constant flow rate exceeding the patient's peak inspiratory demand. The flow of respiratory gases may comprise any one or more of air, oxygen, and heliox (a mixture of helium and oxygen). The flow of respiratory gases may be heated and/or humidified.

[0004] The flow of respiratory gases is delivered to the patient's upper airway through a patient interface. The patient interface may be a nasal cannula.

[0005] Selecting, maintaining inventory, and/or configuring a nasal cannula for a particular patient may pose various challenges. Different patients may benefit from different and/or multiple types of nasal cannulae. And different patients may require different sizes of the same type of nasal cannula. The healthcare professional or patient may need to configure, or reconfigure, the selected nasal cannula to suit the treatment environment and/or patient preferences.

[0006] Some patients may find existing nasal cannulae uncomfortable. For example, the constant flow of heated and humidified gases through the nasal cannula may cause a buildup of heat, and discomfort for the patient, in the region of the philtrum and/or nasolabial sulci.

[0007] The design of a nasal cannula involves balancing a variety of design requirements to meet the evolving needs of manufacturers, healthcare professionals, patients, and/or medical insurers. The design requirements may comprise one or more of efficacy, usability, comfort, logistics, aesthetics, and manufacturing costs, for example.

SUMMARY

[0008] In a first aspect, a nasal cannula system is provided for use in a respiratory support system arranged to deliver a flow of respiratory gases to an upper airway of a patient. The nasal cannula system may comprise: a frame; a first nasal prong module comprising a first nasal prong geometry; and a second nasal prong module comprising a second nasal prong geometry different to the first nasal prong geometry, wherein the frame is arranged to be selectively removably coupled to any one of the first nasal prong module and the second nasal prong module.

[0009] The first nasal prong module may comprise any one or both of: a first nasal prong arranged to form a first left nasal prong; and a second nasal prong arranged to form a first right nasal prong, and the second nasal prong module may comprise any one or both of: a first nasal prong arranged to form a second left nasal prong; and a second nasal prong arranged to form a second right nasal prong.

[0010] The first nasal prong of the first nasal prong module and the second nasal prong module may be arranged to extend into a left nostril of the patient; and the second nasal prong of the first nasal prong module and the second nasal prong module may be arranged to extend into a right nostril of the patient.

[0011] The first nasal prong module may comprise the first left nasal prong and the first right nasal prong; and the second nasal prong module may comprise the second left nasal prong and the second right nasal prong.

[0012] The first nasal prong geometry may be or form an asymmetric nasal prong geometry, such that: an internal transverse dimension or cross-sectional area of the first left nasal prong is different to a corresponding internal transverse dimension or cross-sectional area of the first right nasal prong; and/or an external transverse dimension or cross-sectional area of the first left nasal prong is different to a corresponding external transverse dimension or cross-sectional area of the first right nasal prong.

[0013] The first nasal prong geometry may be or form a left asymmetric nasal prong geometry such that: an internal transverse dimension or cross-sectional area of the first left nasal prong is greater than a corresponding internal transverse dimension or cross-

sectional area of the first right nasal prong; and/or an external transverse dimension or cross-sectional area of the first left nasal prong is greater than a corresponding external transverse dimension or cross-sectional area of the first right nasal prong. The first left nasal prong may be arranged to provide a greater volumetric flow rate than the first right nasal prong.

[0014] The first nasal prong geometry may be or form a right asymmetric nasal prong geometry such that: an internal transverse dimension or cross-sectional area of the first right nasal prong is greater than a corresponding internal transverse dimension or cross-sectional area of the first left nasal prong; and/or an external transverse dimension or cross-sectional area of the first right nasal prong is greater than a corresponding external transverse dimension or cross-sectional area of the first left nasal prong. The first right nasal prong may be arranged to provide a greater volumetric flow rate than the first left nasal prong.

[0015] The second nasal prong geometry may be or form an asymmetric nasal prong geometry, such that: an internal transverse dimension or cross-sectional area of the second left nasal prong is different to a corresponding internal transverse dimension or cross-sectional area of the second right nasal prong; and/or an external transverse dimension or cross-sectional area of the second left nasal prong is different to a corresponding external transverse dimension or cross-sectional area of the second right nasal prong.

[0016] The second nasal prong geometry may be or form a left asymmetric nasal prong geometry such that: an internal transverse dimension or cross-sectional area of the second left nasal prong is greater than a corresponding internal transverse dimension or cross-sectional area of the second right nasal prong; and/or an external transverse dimension or cross-sectional area of the second left nasal prong is greater than a corresponding external transverse dimension or cross-sectional area of the second right nasal prong. The second left nasal prong may be arranged to provide a greater volumetric flow rate than the second right nasal prong.

[0017] The second nasal prong geometry may be or form a right asymmetric nasal prong geometry such that: an internal transverse dimension or cross-sectional area of the second right nasal prong is greater than a corresponding internal transverse dimension or cross-sectional area of the second left nasal prong; and/or an external transverse dimension or cross-sectional area of the second right nasal prong is greater than a corresponding external transverse dimension or cross-sectional area of the second left nasal prong. The second right nasal prong may be arranged to provide a greater volumetric flow rate than the second left nasal prong

[0018] The internal transverse dimension or cross-sectional area of the first left nasal prong may be greater than the internal transverse dimension or cross-sectional area of the second left nasal prong; and/or the external transverse dimension or cross-sectional area of the first left nasal prong may be greater than the external transverse dimension or cross-sectional area of the second left nasal prong.

[0019] The internal transverse dimension or cross-sectional area of the first right nasal prong may be greater than the internal transverse dimension or cross-sectional area of the second right nasal prong; and/or the external transverse dimension or cross-sectional area of the first right nasal prong may be greater than the external transverse dimension or cross-sectional area of the second right nasal prong.

[0020] The internal transverse dimension or cross-sectional area of the first right nasal prong may be greater than the internal transverse dimension or cross-sectional area of the second right nasal prong; and/or the external transverse dimension or cross-sectional area of the first right nasal prong may be greater than the external transverse dimension or cross-sectional area of the second right nasal prong.

[0021] The internal transverse dimension or cross-sectional area of the first left nasal prong may be greater than the internal transverse dimension or cross-sectional area of the second left nasal prong; and/or the external transverse dimension or cross-sectional area of the first left nasal prong may be greater than the external transverse dimension or cross-sectional area of the second left nasal prong.

[0022] The first nasal prong geometry may be or form a mirror-image of the second nasal prong geometry.

[0023] Any one or both of the first nasal prong geometry and the second nasal prong geometry may be or form a symmetric nasal prong geometry, such that: the first left nasal prong may be or form a mirror-image of the first right nasal prong; and/or the second left nasal prong may be or form a mirror-image of the second right nasal prong. The first left nasal prong and first right nasal prong may be arranged to provide substantially the same volumetric flow rate. The second left nasal prong and second right nasal prong may be arranged to provide substantially the same volumetric flow rate

[0024] The first nasal prong geometry may be or form an asymmetric nasal prong geometry such that: an internal transverse dimension or cross-sectional area of the first left nasal prong is different to a corresponding internal transverse dimension or cross-sectional area of the first right nasal prong; and/or an external transverse dimension or cross-sectional area of the first left nasal prong is different to a corresponding external transverse dimension or cross-sectional area of the first right nasal prong, and the

second nasal prong geometry may be or form a symmetric nasal prong geometry such that the second left nasal prong is or forms a mirror-image of the second right nasal prong.

[0025] The nasal cannula system may comprise a third nasal prong module comprising a third nasal prong geometry, wherein the third nasal prong geometry is different from the first nasal prong geometry and the second nasal prong geometry, wherein the frame is arranged to be selectively removably coupled to any one of the first nasal prong module, the second nasal prong module, and the third nasal prong module.

[0026] The third nasal prong module may comprise any one or both of: a first nasal prong arranged to form a third left nasal prong; and a second nasal prong arranged to form a third right nasal prong.

[0027] The first nasal prong of the third nasal prong module may be arranged to extend into a/the left nostril of the patient; and the second nasal prong of the third nasal prong module may be arranged to extend into a/the right nostril of the patient.

[0028] The third nasal prong geometry may be or may form a left asymmetric nasal prong geometry such that: an internal transverse dimension or cross-sectional area of the third left nasal prong is greater than a corresponding internal transverse dimension or cross-sectional area of the third right nasal prong; and/or an external transverse dimension or cross-sectional area of the third left nasal prong is greater than a corresponding external transverse dimension or cross-sectional area of the third right nasal prong. The third left nasal prong may be arranged to provide a greater volumetric flow rate than the third right nasal prong.

[0029] The third nasal prong geometry may be or may form a right asymmetric nasal prong geometry such that: an internal transverse dimension or cross-sectional area of the third right nasal prong is greater than a corresponding internal transverse dimension or cross-sectional area of the third left nasal prong; and/or an external transverse dimension or cross-sectional area of the third right nasal prong is greater than a corresponding external transverse dimension or cross-sectional area of the third left nasal prong. The third right nasal prong may be arranged to provide a greater volumetric flow rate than the third left nasal prong.

[0030] The internal transverse dimension or cross-sectional area of the first left nasal prong may be greater than the internal transverse dimension or cross-sectional area of the second left nasal prong and/or the external transverse dimension or cross-sectional area of the first left nasal prong may be greater than the external transverse dimension or cross-sectional area of the second left nasal prong. The internal transverse dimension or cross-sectional area of the second left nasal prong may be greater than the internal

transverse dimension or cross-sectional area of the third left nasal prong; and/or the external transverse dimension or cross-sectional area of the second left nasal prong may be greater than the external transverse dimension or cross-sectional area of the third left nasal prong.

[0031] The internal transverse dimension or cross-sectional area of the first right nasal prong may be greater than the internal transverse dimension or cross-sectional area of the second right nasal prong and/or the external transverse dimension or cross-sectional area of the first right nasal prong may be greater than the external transverse dimension or cross-sectional area of the second right nasal prong. The internal transverse dimension or cross-sectional area of the second right nasal prong may be greater than the internal transverse dimension or cross-sectional area of the third right nasal prong; and/or the external transverse dimension or cross-sectional area of the second right nasal prong may be greater than the external transverse dimension or cross-sectional area of the third right nasal prong.

[0032] The first nasal prong geometry may be or form a left asymmetric nasal prong geometry such that: an internal transverse dimension or cross-sectional area of the first left nasal prong is greater than a corresponding internal transverse dimension or cross-sectional area of the first right nasal prong; and/or an external transverse dimension or cross-sectional area of the first left nasal prong is greater than a corresponding external transverse dimension or cross-sectional area of the first right nasal prong. The first left nasal prong may be arranged to provide a greater volumetric flow rate than the first right nasal prong. The second nasal prong geometry may be or form a right asymmetric nasal prong geometry such that: an internal transverse dimension or cross-sectional area of the second right nasal prong is greater than a corresponding internal transverse dimension or cross-sectional area of the second left nasal prong; and/or an external transverse dimension or cross-sectional area of the second right nasal prong is greater than a corresponding external transverse dimension or cross-sectional area of the second left nasal prong. The second right nasal prong may be arranged to provide a greater volumetric flow rate than the second left nasal prong. The third nasal prong geometry comprises the third left nasal prong and the third right nasal prong, and the third nasal prong geometry may be or form a symmetric nasal prong geometry such that the third left nasal prong is or forms a mirror-image of the third right nasal prong. The third left nasal prong and third right nasal prong may be arranged to provide substantially the same volumetric flow rate

[0033] The nasal cannula system may comprise a fourth nasal prong module having a fourth nasal prong geometry, wherein the fourth nasal prong geometry is different from the first nasal prong geometry, the second nasal prong geometry, and the third nasal prong geometry, wherein the frame is arranged to be selectively removably coupled to

any one of the first nasal prong module, the second nasal prong module, the third nasal prong module, and the fourth nasal prong module.

[0034] The fourth nasal prong module may comprise any one or both of: a first nasal prong arranged to form a fourth left nasal prong; and a second nasal prong arranged to form a fourth right nasal prong.

[0035] The first nasal prong of the fourth nasal prong module may be arranged to extend into the left nostril of the patient; and the second nasal prong of the fourth nasal prong module may be arranged to extend into the right nostril of the patient.

[0036] The fourth nasal prong geometry may be or form a symmetric nasal prong geometry in that the fourth left nasal prong is a mirror-image of the fourth right nasal prong.

[0037] An internal transverse dimension or cross-sectional area of the third left nasal prong and the third right nasal prong may be different from a corresponding internal transverse dimension or cross-sectional area of the fourth left nasal prong and fourth right nasal prong, respectively; and/or an external transverse dimension or cross-sectional area of the third left nasal prong and the third right nasal prong may be different from a corresponding external transverse dimension or cross-sectional area of the fourth left nasal prong and fourth right nasal prong, respectively.

[0038] The first nasal prong module may be arranged to interact with the flow of respiratory gases received by the first nasal prong module to provide a first nasal high flow therapy to the patient, and the second nasal prong module may be arranged to interact with the flow of respiratory gases received by the second nasal prong module to provide a second nasal high flow therapy to the patient, wherein the second nasal high flow therapy is different to the first nasal high flow therapy.

[0039] Provision of the first nasal high flow therapy or the second nasal high flow therapy by the respiratory support system may be at least partly determined by selection and coupling of the first nasal prong module or the second nasal prong module with the frame, e.g., without the need for a change to any other configuration and/or setting of the respiratory support system.

[0040] The first nasal high flow therapy may be one of an asymmetric nasal high flow therapy or a symmetric nasal high flow therapy; and the second nasal high flow therapy may be the other of the asymmetric nasal high flow therapy or the symmetric nasal high flow therapy.

[0041] The first nasal high flow therapy may be a left asymmetric nasal high flow therapy; and the second nasal high flow therapy may be a right asymmetric nasal high flow therapy.

[0042] Any one or both of the first nasal prong module and the second nasal prong module may be arranged to partially occlude at least one of the left nostril and the right nostril of the patient.

[0043] The first nasal prong module may comprise a first color scheme associated with the first nasal prong geometry, the second nasal prong module may comprise a second color scheme associated with the second nasal prong geometry, wherein the second color scheme is different to the first color scheme.

[0044] The first nasal prong geometry may form: an asymmetric nasal prong geometry, the first color scheme may comprise two colors, wherein the two colors of the first color scheme are associated with a geometry of the first left nasal prong and the first right nasal prong, respectively; or a symmetric nasal prong geometry, the first color scheme may comprise a single color, wherein the single color of the first color scheme is associated with a geometry of the first left nasal prong and the first right nasal prong.

[0045] The second nasal prong geometry may form: an asymmetric nasal prong geometry, the second color scheme comprising two colors, wherein the two colors of the second color scheme are associated with a geometry of the second left nasal prong and the second right nasal prong, respectively; or a symmetric nasal prong geometry, the second color scheme comprising a single color, wherein the single color of the second color scheme is associated with a geometry of the second left nasal prong and the second right nasal prong.

[0046] The first nasal prong module may comprise a first color scheme associated with the first nasal prong geometry, the second nasal prong module may comprise a second color scheme associated with the second nasal prong geometry; the third nasal prong module may comprise a third color scheme associated with the third nasal prong geometry; and the first color scheme, the second color scheme and the third color scheme are different from each other.

[0047] The third nasal prong geometry may be or form: an asymmetric nasal prong geometry, the third color scheme comprising two colors, wherein the two colors of the third color scheme are associated with a geometry of the third left nasal prong and the third right nasal prong, respectively; or a symmetric nasal prong geometry, the third color scheme comprising a single color, wherein the single color of the third color scheme

is associated with a geometry of the third left nasal prong and the third right nasal prong.

[0048] The first nasal prong module may comprise a first color scheme associated with the first nasal prong geometry, the second nasal prong module may comprise a second color scheme associated with the second nasal prong geometry; the third nasal prong module may comprise a third color scheme associated with the third nasal prong geometry; the fourth nasal prong module may comprise a fourth color scheme associated with the fourth nasal prong geometry; and the first color scheme, the second color scheme, the third color scheme and the fourth color scheme are different from each other.

[0049] The fourth nasal prong geometry may form: an asymmetric nasal prong geometry, the fourth color scheme comprising two colors, wherein the two colors of the fourth color scheme is associated with a geometry of the fourth left nasal prong and the fourth right nasal prong, respectively; or a symmetric nasal prong geometry, the fourth color scheme comprising a single color, wherein the single color of the fourth color scheme is associated with a geometry of the fourth left nasal prong and the fourth right nasal prong.

[0050] In a second aspect, a nasal cannula system is provided for use in a respiratory support system arranged to deliver a flow of respiratory gases to an upper airway of a patient. The nasal cannula system may comprise: a frame; a first nasal prong module comprising a first nasal prong geometry; and a second nasal prong module comprising a second nasal prong geometry, wherein: the frame is arranged to be selectively coupled to any one of the first nasal prong module and the second nasal module; and the first nasal prong geometry and the second nasal prong geometry are at least substantially the same or identical.

[0051] The first nasal prong module may comprise any one or both of: a first nasal prong arranged to form a first left nasal prong; and a second nasal prong arranged to form a first right nasal prong, and the second nasal prong module may comprise any one or both of: a first nasal prong arranged to form a second left nasal prong; and a second nasal prong arranged to form a second right nasal prong.

[0052] The first nasal prong of each of the first nasal prong module and the second nasal prong module may be arranged to extend into a left nostril of the patient; and the second nasal prong of each of the first nasal prong module and the second nasal prong module may be arranged to extend into a right nostril of the patient.

[0053] The first nasal prong may comprise the first left nasal prong and the first right nasal prong; and the second nasal prong module may comprise the second left nasal prong and the second right nasal prong.

[0054] The first nasal prong geometry and the second nasal prong geometry may be or form an asymmetric nasal prong geometry, such that: an internal transverse dimension or cross-sectional area of the first left nasal prong and second left nasal prong are different to a corresponding internal transverse dimension or cross-sectional area of the first right nasal prong and second right nasal prong, respectively; and/or an external transverse dimension or cross-sectional area of the first left nasal prong and second left nasal prong are different to a corresponding external transverse dimension or cross-sectional area of the first right nasal prong and second right nasal prong, respectively, wherein: the first left nasal prong and the second left nasal prong comprise the same or substantially the same internal transverse dimension or cross-sectional area and external transverse dimension or cross-sectional area; and/or the first right nasal prong and the second right nasal prong comprise the same or substantially the same internal transverse dimension or cross-sectional area and external transverse dimension or cross-sectional area.

[0055] The nasal cannula system may comprise a coupling member for receiving the flow of respiratory gases for supply via or through the frame, the coupling member being arranged to be removably or permanently coupled with the frame.

[0056] The nasal cannula system may comprise at least one inlet conduit arranged to be coupled with the coupling member, and to receive the flow of respiratory gases for supply to the coupling member; and/or a headgear arranged to be removably and/or adjustably coupled with the frame and to extend around a rear of a head of the patient to secure the frame in position on the head.

[0057] Each of the at least one inlet conduit may comprise a tubing that is at least partially formed from a breathable material.

[0058] The first inlet conduit of the at least one inlet conduit may be arranged to be removably coupled with the coupling member in a single orientation.

[0059] The first inlet conduit of the at least one inlet conduit may be arranged to be selectively and removably coupled with the coupling member in at least two different orientations. The at least two different orientations may comprise a first operational configuration and a second operational configuration.

[0060] The at least one conduit may comprise a first inlet conduit and a second inlet conduit, wherein: the first inlet conduit is arranged to be removably coupled to a first

inlet of the coupling member; and the second inlet conduit is arranged to be removably coupled to a second inlet of the coupling member.

[0061] The frame may be arranged to be selectively removably coupled to any one of the first nasal prong module and the second nasal prong module, adjacent a posterior side of the frame, and the coupling member is arranged to be removably or permanently coupled with the frame adjacent an anterior side of the frame.

[0062] In a third aspect, a nasal prong module is provided for use in a nasal cannula of a respiratory support system arranged to deliver a flow of respiratory gases to an upper airway of a patient. The nasal prong module may comprise: a base portion arranged to be removably coupled with a frame of the nasal cannula, the frame arranged to support the nasal prong module in position, e.g., at an upper lip region of the patient; a body portion coupled with the base portion; and any one or both of: a first nasal prong coupled with and extending from the body portion; and a second nasal prong coupled with and extending from the body portion, wherein the body portion is arranged to receive the flow of respiratory gases for delivery to the upper airway of the patient via any one or both of the first nasal prong and the second nasal prong.

[0063] The nasal prong module may comprise the first nasal prong and the second nasal prong.

[0064] The first nasal prong and the second nasal prong may comprise an asymmetric nasal prong geometry defined by: an internal transverse dimension or cross-sectional area of the first nasal prong being different from a corresponding internal transverse dimension or cross-sectional area of the second nasal prong; and/or an external transverse dimension or cross-sectional area of the first nasal prong being different from a corresponding external transverse dimension or cross-sectional area of the second nasal prong.

[0065] The nasal prong module may be arranged to provide asymmetric nasal high flow therapy to the patient.

[0066] The first nasal prong may be arranged to extend into a left nostril of the patient to form a left nasal prong; and the second nasal prong may be arranged to extend into a right nostril of the patient to form a right nasal prong.

[0067] The left nasal prong and the right nasal prong may form a left asymmetric nasal prong geometry such that: an internal transverse dimension or cross-sectional area of the left nasal prong is greater than a corresponding internal transverse dimension or cross-sectional area of the right nasal prong; and/or an external transverse dimension

or cross-sectional area of the left nasal prong is greater than a corresponding external transverse dimension or cross-sectional area of the right nasal prong.

[0068] The left nasal prong and the right nasal prong may form a right asymmetric nasal prong geometry such that: an internal transverse dimension or cross-sectional area of the right nasal prong is greater than a corresponding internal transverse dimension or cross-sectional area of the left nasal prong; and/or an external transverse dimension or cross-sectional area of the right nasal prong is greater than a corresponding external transverse dimension or cross-sectional area of the left nasal prong.

[0069] The nasal prong module may be arranged to interact with the flow of respiratory gases to provide an asymmetric nasal high flow therapy.

[0070] The nasal prong module may comprise the first nasal prong and the second nasal prong, wherein the first nasal prong and the right nasal prong form a symmetric nasal prong geometry.

[0071] The nasal prong module may be arranged to interact with the flow of respiratory gases to provide a symmetric nasal high flow therapy.

[0072] The base portion may comprise at least one gases inlet aperture arranged to receive the flow of respiratory gases for supply to the body portion and any one or both of the first nasal prong and the second nasal prong.

[0073] The at least one gases inlet aperture may be arranged to be fluidly, such as pneumatically, coupled with at least one inlet conduit supplying the flow of respiratory gases.

[0074] The at least one gases inlet aperture may comprise a first gases inlet aperture and a second gases inlet aperture.

[0075] The nasal prong module may comprise the first nasal prong and the second nasal prong, wherein the first nasal prong is fluidly, such as pneumatically, coupled with the first gases inlet aperture and the second nasal prong is fluidly, such as pneumatically, coupled with the second gases inlet aperture.

[0076] The body portion may comprise at least one gas carrying portion arranged to: fluidly, such as pneumatically, couple with the at least one gases inlet aperture, and provide gas flow path(S) for the flow of respiratory gases from the at least one gases inlet aperture to any one or both of the first nasal prong and the second nasal prong.

[0077] The at least one gas carrying portion may be arranged to fluidly, such as pneumatically, couple: the first nasal prong with the first gases inlet aperture of the body portion; and/or the second nasal prong with the second gases inlet aperture of the body portion.

[0078] The at least one gas carrying portion may comprise: a first gas carrying portion fluidly, such as pneumatically, coupled with the first gases inlet aperture and the first nasal prong; and a second gas carrying portion fluidly, such as pneumatically, coupled with the second gases inlet aperture and the second nasal prong.

[0079] The first gas carrying portion and the second gas carrying portion may be separate from each other.

[0080] The at least one gases inlet aperture may be arranged to be fluidly, such as pneumatically, coupled with at least one outlet opening of the frame.

[0081] The at least one gases inlet aperture may comprise a first gases inlet aperture and a second gases inlet aperture, wherein: the first gases inlet aperture and the first nasal prong are arranged to fluidly, such as pneumatically, couple with a first outlet opening of the frame, and the second gases inlet aperture and the second nasal prong are arranged to fluidly and/or sealingly couple with a second outlet opening of the frame.

[0082] The base portion may be arranged to form a face seal with any one or both of the first outlet opening and the second outlet opening of the frame.

[0083] The base portion may comprise a first gases inlet aperture and a second gases inlet aperture, and the body portion may comprise a first gas carrying portion and a second gas carrying portion, wherein: the first gases inlet aperture of the base portion is arranged at least substantially coaxially with an inlet end of the first gas carrying portion of the body portion; and/or the second gases inlet aperture of the base portion is arranged at least substantially coaxially with an inlet end of the second gas carrying portion of the body portion.

[0084] The base portion may comprise a first gases inlet aperture and a second gases inlet aperture, and the body portion may comprise a first gas carrying portion and a second gas carrying portion, wherein: the first gases inlet aperture of the base portion may comprise an internal transverse dimension or cross-sectional area equal to or greater than an internal transverse dimension or cross-sectional area of an inlet end of the first gas carrying portion; and/or the second gases inlet aperture of the base portion may comprise an internal transverse dimension or cross-sectional area equal to or greater than an internal transverse dimension or cross-sectional area of an inlet end of the second gas carrying portion.

[0085] The base portion may comprise a recess for accommodating or preventing interference with a portion of the nasal cannula, such as a pin.

[0086] The base portion may comprise a first gases inlet aperture and a second gases inlet aperture, wherein the recess is positioned intermediate the first gases inlet aperture and the second gases inlet aperture.

[0087] The recess may be circular or rectangular.

[0088] The base portion may be opaque. The body portion may be translucent.

[0089] The base portion may comprise a first material and the body portion may comprise a second material, wherein the first material is more rigid than the second material.

[0090] The second material may be an elastomer.

[0091] The elastomer may be silicone rubber.

[0092] The body portion may be at least partially made up of an elastomer, such as silicone rubber and/or a thermoplastic elastomer.

[0093] The base portion may be at least partially made up of any one or more of polypropylene, nylon, acrylonitrile butadiene styrene (ABS), polycarbonates, and polyoxymethylene (POM).

[0094] The base portion may have a different color compared to the body portion.

[0095] The base portion may have a first color and a second color, wherein the first color is associated with a geometry of the first nasal prong and the second color is associated with a geometry of the second nasal prong.

[0096] The nasal prong module may comprise an asymmetric nasal prong geometry, wherein the second color is different to the first color; or the nasal prong module may comprise a symmetric nasal prong geometry, wherein the second color is the same as the first color.

[0097] The body portion may at least in part define a cavity separated from: at least one gas carrying portion of the body portion, and/or a flow path for the flow of respiratory gases through the nasal prong module.

[0098] The body portion may comprise a first gas carrying portion and a second gas carrying portion, wherein the cavity is separated from the first gas carrying portion and the second gas carrying portion.

[0099] The cavity may be open to ambient air.

[0100] The cavity may be open to ambient air at a lower region of the body portion.

[0101] The cavity may be at least in part located in a central region, such as a laterally central region, of the body portion.

[0102] The base portion may comprise a first gases inlet aperture and a second gases inlet aperture, wherein the cavity is at least in part located between, such as laterally between, the first gases inlet aperture and the second gases inlet aperture.

[0103] The body portion may comprise: a first longitudinal side wall, a first lateral side wall, a second lateral side wall, and a posterior wall, the first longitudinal side wall, the first lateral side wall, and the second lateral side wall at least in part defining the cavity.

[0104] The central region of the posterior wall may comprise: a posterior side arranged to engage the upper lip region of the patient, and an anterior side opposing the posterior surface, the anterior side exposed to ambient air within the cavity.

[0105] At least a portion of the first nasal prong and the second nasal prong may project or extend from the first longitudinal side wall and/or the posterior wall, in a posterior direction away from the base portion.

[0106] The cavity may be further defined by any one or more of: the base portion, a second longitudinal side wall of the body portion, at least one gas carrying portion of the body portion, the first nasal prong, and the second nasal prong.

[0107] The cavity may provide an air gap between the at least one gas carrying portion and any one or more of: at least a portion of the posterior wall; at least a portion of the first longitudinal side wall of the body portion; at least a portion of the second longitudinal side wall of the body portion; the first lateral side wall; and the second lateral side wall.

[0108] The body portion may comprise a first gas carrying portion and a second gas carrying portion, the cavity providing an air gap between the first gas carrying portion and the second gas carrying portion.

[0109] The body portion may comprise: a posterior wall arranged to engage the upper lip region of the patient, and a pair of lateral extensions, the pair of lateral extensions

extending laterally from the posterior wall beyond any one or both of: the base portion; and a first lateral side wall and a second lateral side wall of the body portion, respectively.

[0110] The pair of lateral extensions cantilevered from any one or both of: the posterior wall, and the first lateral side wall and the second lateral side wall of the body portion, respectively.

[0111] The pair of lateral extensions may comprise a varying thickness.

[0112] A thickness of each of the pair of lateral extensions may taper from a first end to a second end. The first end may be proximate a/the central region of the posterior wall and the second end may be distal from the central region of the posterior wall.

[0113] The pair of lateral extensions may be arranged to: cushion the patient from the frame; and/or provide decoupling elements for removal of the nasal prong module from the frame.

[0114] The distal ends of the pair of lateral extensions may be arranged to be spaced from the frame when the nasal prong module is coupled with the frame but before the nasal cannula is fitted to the patient.

[0115] The distal ends of the pair of lateral extensions may be arranged to be supported by or contact the frame when the nasal prong module is coupled with the frame and the nasal cannula is fitted to the patient or pressed against the patient's face by an external force.

[0116] The posterior wall and the pair of lateral extensions together may form a posterior contact surface of the body portion.

[0117] The posterior contact surface may comprise a continuous curve arranged to at least substantially follow a curvature of an upper lip region of the patient.

[0118] The posterior side of the base portion may comprise a concave curve structure.

[0119] The base portion may comprise a central waist region, a height of the body portion at least in part tapering towards the central waist region.

[0120] The base portion may be arranged to resiliently flex upon removal of the nasal prong module from the frame.

[0121] The nasal prong module (e.g., the base portion) may be arranged to couple with the frame in only a single orientation.

[0122] The nasal prong module (e.g., the base portion) may comprise one or more coupling structures arranged to removably engage and/or cooperate with one or more corresponding attachment structures of the frame.

[0123] One or more coupling structures of the base portion may be arranged to be removably coupled with the one or more corresponding attachment structures of the frame in a removable snap fit.

[0124] The removable snap fit may be arranged to provide any one or more of: tactile feedback; audible feedback; and visual feedback.

[0125] When removably coupled to the one or more attachment structures of the frame, the one or more coupling structures of the base portion may be arranged to abut or be proximate to a coupling member of the nasal cannula assembly to provide visual feedback.

[0126] The one or more of the coupling structures may be arranged to resiliently deflect and at least partially recover as the base portion is coupled with the frame.

[0127] The one or more coupling structures may be each bisected by a sagittal plane of the nasal prong module.

[0128] The one or more coupling structures may project in an anterior direction, away from the body portion.

[0129] Each of the one or more coupling structures may comprise a protrusion arranged to engage or mate with a recess or underside portion of the respective one or more attachment structures of the frame.

[0130] The protrusions may be located on inward surfaces at or proximate distal ends of the one or more coupling structures.

[0131] The base portion may comprise a pair of coupling structures arranged to cooperate with a corresponding pair of attachment structures of the frame.

[0132] At least one of the pair of coupling structures may comprise at least one slot arranged to cooperate with at least one corresponding protrusion of the frame.

[0133] The at least one slot may be centrally located on the respective coupling structure.

[0134] One of the pair of coupling structures may be located on a first longitudinal side of the base portion and the other of the pair of coupling structures may be located on a

second longitudinal side of the base portion; and the first longitudinal side of the base portion may be on the same side as a/the first longitudinal side of the body portion.

[0135] The pair of coupling structures may comprise at least one slot arranged to cooperate with at least one corresponding protrusion of the frame, wherein the coupling structure on the first longitudinal side of the base portion comprises the at least one slot.

[0136] At least one of the pair of coupling structures may comprise at least one slot arranged to cooperate with at least one corresponding protrusion of the frame, wherein the coupling structure on the second longitudinal side of the base portion comprises the at least one slot.

[0137] The pair of coupling structures may be located in an opposing relationship.

[0138] The pair of coupling structures may comprise a first coupling structure and a second coupling structure, the first coupling structure comprising a first coupling structure geometry and the second coupling structure comprising a second coupling structure geometry different to the first coupling structure geometry.

[0139] The first coupling structure may be wider than the second coupling structure.

[0140] The base portion and the body portion may be integrally formed.

[0141] In a fourth aspect, a nasal prong module is provided for use in a nasal cannula assembly of a respiratory support system arranged to deliver a flow of respiratory gases to an upper airway of a patient. The nasal prong module may comprise a body portion comprising: at least one gas carrying portion; a cavity; and a posterior wall arranged to contact and/or engage the upper lip region of the patient; and wherein the cavity is positioned between at least a portion of the posterior wall and the at least one gas carrying portion.

[0142] The nasal prong module cavity may be arranged to provide a separation, such as thermally spacing, from at least a portion of the at least one gas carrying portion and at least a portion of the remainder of the body portion, such as at least a portion of the posterior wall.

[0143] The cavity may be arranged to at least partially thermally isolate the at least one gas carrying portion from at least a portion of the posterior wall.

[0144] The cavity may be exposed to ambient air.

[0145] The cavity may be at least in part located in a central region of the body portion.

[0146] The body portion may comprise: a first longitudinal side wall, a first lateral side wall, and a second lateral side wall, the first longitudinal side wall, the first lateral side wall, and the second lateral side wall at least in part defining the cavity.

[0147] The cavity may be further defined by any one or more of: a base portion of the nasal prong module; a second longitudinal side wall of the body portion; the at least one gas carrying portion; and at least one nasal prong of the nasal prong module.

[0148] The cavity may provide an air gap between the at least one gas carrying portion and any one or more of: the second longitudinal side wall of the body portion; the first lateral side wall; and the second lateral side wall.

[0149] The at least one gas carrying portion may comprise a first gas carrying portion and a second gas carrying portion; and the cavity may provide an air gap between the first gas carrying portion and the second gas carrying portion.

[0150] The posterior wall may comprise: a posterior surface arranged to engage an upper lip region of the patient; and an anterior surface opposing the posterior surface, the anterior surface being exposed to the ambient air within the cavity.

[0151] In a fifth aspect, a nasal cannula is provided for use in a nasal cannula assembly of a respiratory support system arranged to deliver a flow of respiratory gases to an upper airway of a patient. The nasal cannula may comprise: a patient-contacting portion comprising a posterior wall arranged to contact and/or engage an upper lip region of the patient, and at least one gas carrying portion, wherein the nasal cannula comprises a cavity positioned between at least a portion of the posterior wall and the at least one gas carrying portion.

[0152] The cavity may be arranged to at least partially thermally isolate the at least one gas carrying portion from at least a portion of the posterior wall.

[0153] The cavity may be exposed to ambient air.

[0154] The cavity may be at least in part located in a central region of the patient-contacting portion.

[0155] At least one nasal prong may be fluidly coupled to the at least one gas carrying portion.

[0156] The patient-contacting portion may comprise: a first longitudinal side wall, a first lateral side wall, and a second lateral side wall, the first longitudinal side wall, the first lateral side wall, and the second lateral side wall at least in part defining the cavity.

[0157] The cavity may be further defined by any one or more of: a second longitudinal side wall of the patient-contacting portion; the at least one gas carrying portion; a first nasal prong of the nasal cannula; and a second nasal prong of the nasal cannula.

[0158] The cavity may provide an air gap between the at least one gas carrying portion and any one or more of: the second longitudinal side wall of the body portion; the first lateral side wall; and the second lateral side wall.

[0159] The at least one gas carrying portion may comprise a first gas carrying portion and a second gas carrying portion; and the cavity may provide an air gap between the first gas carrying portion and the second gas carrying portion.

[0160] In a sixth aspect, a nasal prong module is provided for use in a nasal cannula assembly of a respiratory support system arranged to deliver a flow of respiratory gases to an upper airway of a patient. The nasal prong module may be arranged to be removably coupled with a frame of the nasal cannula assembly. The nasal prong module may comprise one or more coupling structures arranged to engage and/or cooperate with one or more corresponding attachment structures of a frame of the nasal cannula assembly.

[0161] The nasal prong module may comprise a base portion. The base portion may comprise the one or more coupling structures.

[0162] The nasal prong module may be arranged to couple with the frame in only a single orientation.

[0163] The nasal prong module may comprise a body portion coupled to the base portion.

[0164] The base portion and the body portion may be integrally formed.

[0165] The one or more coupling structures may project in an anterior direction, away from the body portion.

[0166] Each of the one or more coupling structures may comprise a protrusion arranged to mate with a recess of the respective one or more attachment structures of the frame.

[0167] The protrusions may be located on inward surfaces at or proximate distal ends of the one or more coupling structures. In other words, each protrusion may be located on an inward surface at or proximate the distal end of the respective coupling structure.

[0168] The nasal prong module (e.g., the base portion) may comprise a pair of coupling structures arranged to cooperate with a corresponding pair of attachment structures of the frame.

[0169] One of the pair of coupling structures may be located on a first longitudinal side of the base portion and the other of the pair of coupling structures may be located on a second longitudinal side of the base portion.

[0170] At least one of the pair of coupling structures may comprise at least one slot arranged to cooperate with at least one protrusion of the frame. The at least one slot may be centrally located on the respective coupling structure.

[0171] For example, the first coupling structure may comprise a slot arranged to cooperate with a protrusion of the frame. The slot may be centrally located on the first coupling structure.

[0172] The pair of coupling structures may be located in an opposing relationship.

[0173] The pair of coupling structures may comprise a first coupling structure and a second coupling structure, the first coupling structure may comprise a first coupling structure geometry and the second coupling structure may comprise a second coupling structure geometry different to the first coupling structure geometry.

[0174] The first coupling structure may be wider than the second coupling structure.

[0175] The one or more coupling structures may be arranged to be removably coupled with the one or more corresponding attachment structures of the frame in a removable snap fit. The removable snap fit is arranged to provide any one or more of: tactile feedback; audible feedback; and visual feedback.

[0176] The base portion may be arranged to resiliently flex upon removal of the nasal prong module from the frame. The one or more of the coupling structures may be arranged to resiliently deflect and at least partially recover as the nasal prong module is removably coupled with the frame.

[0177] The one or more coupling structures may each be bisected by a sagittal plane of the nasal prong module.

[0178] The nasal prong module may comprise a body portion coupled to the base portion. The one or more coupling structures may project from the base portion in an anterior direction, away from the body portion. The base portion may comprise a first material and the body portion may comprise a second material. The first material may be more rigid than the second material.

[0179] The body portion may comprise: a posterior wall arranged to engage the upper lip region of the patient, and a pair of lateral extensions. The pair of lateral extensions may extend laterally from the posterior wall beyond any one or both of: the base portion; and a first lateral side wall and a second lateral side wall of the body portion, respectively. The pair of lateral extensions may comprise a varying thickness.

[0180] The pair of lateral extensions may be arranged to: cushion the patient from the frame; and/or provide decoupling elements for removal of the nasal prong module from the frame. The decoupling elements may be arranged to be used to urge or cause the nasal prong module to decouple from the frame.

[0181] The posterior wall and the pair of lateral extensions may together form a posterior contact surface of the body portion.

[0182] The nasal prong module may comprise: a first nasal prong coupled with and extending from the body portion, the first nasal prong arranged to extend into a left nostril of the patient to form a left nasal prong; and a second nasal prong coupled with and extending from the body portion, the second nasal prong arranged to extend into a right nostril of the patient to form a right nasal prong. The nasal prong module may be arranged to receive the flow of respiratory gases for delivery to the upper airway of the patient via any one or both of the first nasal prong and the second nasal prong.

[0183] The nasal prong module may comprise an asymmetric nasal prong geometry defined by: an internal transverse dimension or cross-sectional area of the first nasal prong being different from a corresponding internal transverse dimension or cross-sectional area of the second nasal prong; and/or an external transverse dimension or cross-sectional area of the first nasal prong being different from a corresponding external transverse dimension or cross-sectional area of the second nasal prong. The nasal prong module may be arranged to interact with the flow of respiratory gases to provide an asymmetric nasal high flow therapy.

[0184] The base portion may comprise: a first gases inlet aperture coupled with the first nasal prong; and a second gases inlet aperture coupled with the second nasal prong. The first gases inlet aperture and second gases inlet aperture may be arranged to receive the flow of respiratory gases for supply to the first nasal prong and the second nasal prong, respectively. The first and second gases inlet apertures may be arranged to be fluidly coupled with at least one inlet conduit supplying the flow of respiratory gases.

[0185] In a seventh aspect, a kit of parts for a nasal cannula assembly is provided. The kit of parts may comprise: at least one nasal prong module according to any one of the third, fourth and sixth aspects and their possible examples, and any one or more of: the

frame; a coupling member arranged to be coupled with the frame; at least one inlet conduit arranged to be coupled with the coupling member; at least one coupling member connector arranged to couple the at least one inlet conduit with the coupling member; and headgear arranged to be coupled with the frame for securing the nasal cannula assembly to a patient's head.

[0186] In an eighth aspect, a kit of parts for a nasal cannula assembly is provided. The kit of parts may comprise: a frame; a coupling member arranged to be coupled with the frame; and at least one inlet conduit arranged to be coupled with the coupling member.

[0187] In a ninth aspect, a kit of parts for a nasal cannula is provided. The of kit of parts may comprise a nasal prong module, the nasal prong module may comprise: a first nasal prong arranged to form a left nasal prong; and a second nasal prong arranged to form a right nasal prong, wherein the left nasal prong and the right nasal prong form a left asymmetric nasal prong geometry such that: an internal transverse dimension or cross-sectional area of the left nasal prong is greater than a corresponding internal transverse dimension or cross-sectional area of the right nasal prong; and/or an external transverse dimension or cross-sectional area of the left nasal prong is greater than a corresponding external transverse dimension or cross-sectional area of the right nasal prong.

[0188] In a tenth aspect, a kit of parts for a nasal cannula is provided. The kit of parts may comprise a nasal prong module, the nasal prong module may comprise: a first nasal prong arranged to form a left nasal prong; and a second nasal prong arranged to form a right nasal prong, wherein the left nasal prong and right nasal prong form a right asymmetric nasal prong geometry such that: an internal transverse dimension or cross-sectional area of the right nasal prong is greater than a corresponding internal transverse dimension or cross-sectional area of the left nasal prong; and/or an external transverse dimension or cross-sectional area of the right nasal prong is greater than a corresponding external transverse dimension or cross-sectional area of the left nasal prong.

[0189] In an eleventh aspect, a kit of parts for a nasal cannula system is provided. The kit of parts may comprise two or more nasal prong modules. A frame of the nasal cannula system may be arranged to be selectively removably coupled to any one of the two or more nasal prong modules. The two or more nasal prong modules may comprise: a first nasal prong module may comprise: a first nasal prong arranged to form a first left nasal prong; and a second nasal prong arranged to form a first right nasal prong, wherein the first nasal prong module (e.g., the first left nasal prong and the first right nasal prong) may comprise or form a first nasal prong geometry; and a second nasal prong module may comprise: a first nasal prong arranged to form a second left nasal prong; and a

second nasal prong arranged to form a second right nasal prong, wherein the second nasal prong module (e.g., the second left nasal prong and the second right nasal prong) comprise or form a second nasal prong geometry, wherein the first nasal prong geometry is different from the second nasal prong geometry.

[0190] The first nasal prong geometry may be or form a left asymmetric nasal prong geometry such that: an internal transverse dimension or cross-sectional area of the first left nasal prong is greater than a corresponding internal transverse dimension or cross-sectional area of the first right nasal prong; and/or an external transverse dimension or cross-sectional area of the first left nasal prong is greater than a corresponding external transverse dimension or cross-sectional area of the first right nasal prong, and the second nasal prong geometry may be or form a right asymmetric nasal prong geometry such that: an internal transverse dimension or cross-sectional area of the second right nasal prong is greater than a corresponding internal transverse dimension or cross-sectional area of the second left nasal prong; and/or an external transverse dimension or cross-sectional area of the second right nasal prong is greater than a corresponding external transverse dimension or cross-sectional area of the second left nasal prong. The first left nasal prong may be arranged to provide a greater volumetric flow rate than the first right nasal prong. The second right nasal prong may be arranged to provide a greater volumetric flow rate than the second left nasal prong.

[0191] The first nasal prong geometry may be or form a left asymmetric nasal prong geometry such that: an internal transverse dimension or cross-sectional area of the first left nasal prong is greater than a corresponding internal transverse dimension or cross-sectional area of the first right nasal prong; and/or an external transverse dimension or cross-sectional area of the first left nasal prong is greater than a corresponding external transverse dimension or cross-sectional area of the first right nasal prong, and the second nasal prong geometry may be or form a left asymmetric nasal prong geometry such that: an internal transverse dimension or cross-sectional area of the second left nasal prong is greater than a corresponding internal transverse dimension or cross-sectional area of the second right nasal prong; and/or an external transverse dimension or cross-sectional area of the second left nasal prong is greater than a corresponding external transverse dimension or cross-sectional area of the second right nasal prong. The first left nasal prong may be arranged to provide a greater volumetric flow rate than the first right nasal prong. The second left nasal prong may be arranged to provide a greater volumetric flow rate than the second right nasal prong.

[0192] The first nasal prong geometry may be or form a right asymmetric nasal prong geometry such that: an internal transverse dimension or cross-sectional area of the first right nasal prong is greater than a corresponding internal transverse dimension or cross-sectional area of the first left nasal prong; and/or an external transverse dimension or

cross-sectional area of the first right nasal prong is greater than a corresponding external transverse dimension or cross-sectional area of the first left nasal prong, and the second nasal prong geometry may be or form a right asymmetric nasal prong geometry such that: an internal transverse dimension or cross-sectional area of the second right nasal prong is greater than a corresponding internal transverse dimension or cross-sectional area of the second left nasal prong; and/or an external transverse dimension or cross-sectional area of the second right nasal prong is greater than a corresponding external transverse dimension or cross-sectional area of the second left nasal prong. The first right nasal prong may be arranged to provide a greater volumetric flow rate than the first left nasal prong. The second right nasal prong may be arranged to provide a greater volumetric flow rate than the second left nasal prong.

[0193] The internal transverse dimension or cross-sectional area of the first left nasal prong may be greater than the internal transverse dimension or cross-sectional area of the second left nasal prong; and/or the external transverse dimension or cross-sectional area of the first left nasal prong may be greater than the external transverse dimension or cross-sectional area of the second left nasal prong.

[0194] The internal transverse dimension or cross-sectional area of the first right nasal prong may be greater than the internal transverse dimension or cross-sectional area of the second right nasal prong; and/or the external transverse dimension or cross-sectional area of the first right nasal prong may be greater than the external transverse dimension or cross-sectional area of the second right nasal prong.

[0195] The two or more nasal prong modules may comprise a third nasal prong module and/or a fourth nasal prong module.

[0196] The third nasal prong geometry may be or may form a left asymmetric nasal prong geometry such that: an internal transverse dimension or cross-sectional area of the third left nasal prong is greater than a corresponding internal transverse dimension or cross-sectional area of the third right nasal prong; and/or an external transverse dimension or cross-sectional area of the third left nasal prong is greater than a corresponding external transverse dimension or cross-sectional area of the third right nasal prong. The third left nasal prong may be arranged to provide a greater volumetric flow rate than the third right nasal prong.

[0197] The third nasal prong geometry may be or may form a right asymmetric nasal prong geometry such that: an internal transverse dimension or cross-sectional area of the third right nasal prong is greater than a corresponding internal transverse dimension or cross-sectional area of the third left nasal prong; and/or an external transverse dimension or cross-sectional area of the third right nasal prong is greater than a

corresponding external transverse dimension or cross-sectional area of the third left nasal prong. The third right nasal prong may be arranged to provide a greater volumetric flow rate than the third left nasal prong.

[0198] The third nasal prong module may form a first symmetric nasal prong geometry; the fourth nasal prong module may form a second symmetric nasal prong geometry. Nasal prongs of the first symmetric nasal prong geometry may form a mirror-image of each other. Nasal prongs of the second symmetric nasal prong geometry may form a mirror-image of each other. The nasal prongs of the first symmetric nasal prong geometry may be different from those of the second symmetric nasal prong geometry in one or more respects, such as internal or external transverse dimension or cross-sectional area of the respective nasal prongs.

[0199] In a twelfth aspect, a nasal cannula is provided for use in a respiratory support system arranged to deliver a flow of respiratory gases to an upper airway of a patient. The nasal cannula may comprise: a frame; a coupling member arranged to be operatively coupled to the frame in a first operational configuration of the nasal cannula and a second operational configuration of the nasal cannula, any one or both of the coupling member and the frame being arranged to be rotatable with respect to one another between the first operational configuration of the nasal cannula and the second operational configuration of the nasal cannula.

[0200] The coupling member may be arranged to rotate relative to the frame, optionally about a common axis.

[0201] Each of the frame and the coupling member may be arranged to rotate about a common axis.

[0202] The frame and the coupling member may be arranged to rotate with respect to each other about a common axis.

[0203] The common axis may be centrally located on any one or both of the frame and the coupling member.

[0204] The common axis may be positioned at a coupling position of the frame and the coupling member.

[0205] The frame and the coupling member may be arranged to pivot or rotate at least approximately 180° (or approximately 180°) with respect to each other between the first operational configuration and the second operational configuration.

[0206] The first operational configuration may be a mirror image of the second operational configuration.

[0207] In the first operational configuration, a first inlet opening of the frame may be coupled to a first gas outlet of the coupling member and a second inlet opening of the frame may be coupled to a second gas outlet of the coupling member; and in the second operational configuration, the first inlet opening of the frame may be coupled to the second gas outlet of the coupling member and the second inlet opening of the frame may be coupled to the first gas outlet of the coupling member.

[0208] The coupling member may comprise a first end comprising a gas inlet. The gas inlet may be arranged to be coupled to an inlet conduit and receive the flow of respiratory gases from the inlet conduit. The coupling member may comprise a second end that is opposite to the first end, where the second end may be closed.

[0209] The nasal cannula may be arranged to move into or move out of the first operational configuration or the second operational configuration when: the position of the frame is fixed and a force is applied to the coupling member; or the position of the coupling member is fixed and a force is applied to the frame; or a first force is applied to the frame and a second force is applied to the coupling member, the direction of the first force being opposite to the direction of the second force.

[0210] The nasal cannula may comprise a retention mechanism. The retention mechanism may be arranged to removably or reversibly retain the frame and coupling member in any one of the first operational configuration and the second operational configuration.

[0211] The retention mechanism may provide any one or more of: visual feedback; audio feedback; and tactile feedback, when the frame and the coupling member are moved into and/or out of the first operational configuration and the second operational configuration.

[0212] The frame may comprise one or more securing members; the coupling member may comprise one or more receiving portions; the one or more securing members and the one or more receiving portions may form at least a portion of the retention mechanism; and the one or more securing members may be arranged to be reversibly or removably coupled to the one or more receiving portions in any one of the first operational configuration and the second operational configuration.

[0213] The frame (e.g., one or more securing members) may be arranged to be coupled to, and decoupled from, the coupling member (e.g., the one or more receiving portions) in a bi-directional manner.

[0214] The one or more receiving portions may be spaced from gas outlet(S) of the coupling member.

[0215] At least a portion of the frame may be arranged to be positioned in a space between the one or more receiving portions and the gas outlet(S) of the coupling member.

[0216] Each of the one or more receiving portions may comprise two protrusions defining a receiving recess therebetween, each receiving recess being arranged to receive at least a portion of a respective securing member.

[0217] The receiving recess may comprise a curved configuration, and each of the one or more securing members may comprise a post, wherein the curved configuration of each receiving recess is arranged to cooperate with or correspond to a curved configuration of a corresponding post of the one or more securing members.

[0218] The frame and the coupling member may be moved into the first operational configuration or the second operational configuration when urged by a first force above a first threshold. The frame and the coupling member may be moved out of the first operational configuration or the second operational configuration when urged by a second force above a second threshold.

[0219] When the nasal cannula is in the first operational configuration or the second operational configuration, the one or more securing members and the one or more receiving portions may be arranged to: be decoupled when urged by a force above a first threshold; and remain coupled in the absence of a force that is above the first threshold, and when the nasal cannula is in the first operational configuration or the second operational configuration, the one or more securing members and the one or more receiving portions may be arranged to: be coupled when urged by a force above a second threshold; and remain decoupled in the absence of force that is above the second threshold.

[0220] The first threshold and the second threshold may be at least substantially the same.

[0221] The force (e.g., the first and second forces) may be a rotational force.

[0222] The one or more receiving portions may comprise a first receiving portion and a second receiving portion.

[0223] The one or more securing members may comprise a first securing member and a second securing member.

[0224] The one or more receiving portions may comprise a first receiving portion and a second receiving portion, and the one or more securing members may comprise a first securing member and a second securing member, wherein: in the first operational configuration, the first securing member is arranged to be coupled with the first receiving portion and the second securing member is arranged to be coupled with the second receiving portion; and in the second operational configuration, the first securing member is arranged to be coupled with the second receiving portion and the second securing member is arranged to be coupled with the first receiving portion.

[0225] The frame may be more flexible or compliant than the coupling member.

[0226] The nasal cannula may comprise a fastening mechanism that is arranged to limit or prohibit flexion or deformation of the frame in any one of the first operational configuration and the second operational configuration.

[0227] The frame may comprise one or more blocking portions; the coupling member may comprise one or more barrier portions; the one or more blocking portions and the one or more barrier portions may form at least a portion of the fastening mechanism; and the one or more blocking portions may be arranged to abut or press against or engage the one or more barrier portions in any one of the first operational configuration and the second operational configuration.

[0228] The one or more blocking portions may comprise a first blocking portion and a second blocking portion. The one or more barrier portions may comprise a first barrier portion and a second barrier portion.

[0229] In the first operational configuration, the first blocking portion may be arranged to engage or abut or press against the first barrier portion and second blocking portion may be arranged to engage or abut or press against the second barrier portion. In the second operational configuration, the first blocking portion may be arranged to engage or abut or press against the second barrier portion and second blocking portion may be arranged to engage or abut or press against the first barrier portion.

[0230] The one or more blocking portions may comprise a surface that is at least substantially planar.

[0231] The one or more barrier portions may comprise a raised portion.

[0232] The coupling member may comprise: a main body; a first extension positioned at or proximate to a first end of the main body, the first extension extending away from the main body; and a second extension positioned at or proximate to a second end of

the main body, the second extension extending away from the main body, wherein the first end and the second end of the main body are oppositely arranged.

[0233] At least a portion of the main body of the coupling member may be tapered.

[0234] The coupling member (e.g., the main body) may comprise a larger cross-sectional area at a first end than a second end.

[0235] The rate of reduction in cross-sectional area is at least substantially constant from a first point to a second point, first point being positioned closer to the first end.

[0236] The first point may be positioned at or proximate to the first end of the main body; and/or the second point may be positioned at or proximate to the second end of the main body.

[0237] The first end may comprise a gas inlet. The first end (e.g., the gas inlet) may be arranged to be coupled to an inlet conduit. The second end may be closed.

[0238] The first end may be arranged to be coupled to the inlet conduit via a coupling member connector.

[0239] The main body may comprise at least one dipped region arranged to accommodate a septum of the patient.

[0240] The main body may comprise a first longitudinal side and a second longitudinal side opposite the first longitudinal side, the first longitudinal side comprising a first dipped region and the second longitudinal side comprising a second dipped region.

[0241] The first dipped region may be arranged to accommodate the septum of the patient in the first operational configuration. The second dipped region may be arranged to accommodate the septum of the patient in the second operational configuration.

[0242] The frame may comprise one or more first sealing members and the coupling member may comprise one or more second sealing members; the one or more first sealing members and the one or more second sealing members arranged to cooperate with each other in any one of the first operational configuration and the second operational configuration, to provide a gas flow path between the coupling member and the frame that is at least substantially sealed from ambient air.

[0243] The one or more first sealing members and the one or more second sealing members may be arranged to provide a groove and tongue sealing arrangement.

[0244] The one or more first sealing members may comprise a first tongue and a second tongue; the one or more second sealing members may comprise a first groove and a second groove; in the first operational configuration, the first groove may be arranged to receive and at least substantially seal against the first tongue and the second groove may be arranged to receive and at least substantially seal against the second tongue; and in the second operational configuration, the first groove may be arranged to receive and at least substantially seal against the second tongue and the second groove may be arranged to receive and at least substantially seal against the first tongue.

[0245] The first tongue may be provided around or proximate to a first inlet opening of the frame; the second tongue may be provided around or proximate to a second inlet opening of the frame; the first groove may be provided around or proximate to a first gas outlet of the coupling member; and the second groove may be provided around or proximate to a second gas outlet of the coupling member.

[0246] The frame and the coupling member may be coupled by a pin.

[0247] In a thirteenth aspect, a frame for a nasal cannula is provided for use in a respiratory support system arranged to deliver a flow of respiratory gases to an upper airway of a patient. The frame may comprise: a central portion; a first side arm attached to a first end of the central portion via a first connecting region, the first connecting region comprising a smaller thickness and/or width in comparison to the central portion and the first side arm; and a second side arm attached to a second end of the central portion via a second connecting region, the second connecting region comprising a smaller thickness and/or width in comparison to the central portion and the second side arm.

[0248] The first connecting region and the second connecting region may be each arranged to flex in multiple directions.

[0249] The frame may comprise a first pivoting or flexing axis at or proximate to the first connecting region and a second pivoting or flexing axis at or proximate to the second connecting region, wherein the first side arm is arranged to pivot or flex about the first pivoting or flexing axis and the second side arm is arranged to pivot or flex about the second pivoting or flexing axis.

[0250] The first side arm and the second side arm may be each arranged to pivot or flex towards and away from a posterior surface of the central portion.

[0251] The first connecting region and the second connecting region may be each arranged to be more flexible than the central portion, the first side arm, and the second side arm.

[0252] The first side arm may comprise a first overmolded portion and the second side arm may comprise a second overmolded portion. The first overmolded portion and the second overmolded portion may be made of a material that is softer than that of the central portion, the first connecting region, and/or the second connecting region.

[0253] In a fourteenth aspect, a nasal cannula is provided for use in a respiratory support system arranged to deliver a flow of respiratory gases to an upper airway of a patient. The nasal cannula system may comprise the frame of any of the preceding aspects.

[0254] The nasal cannula may comprise the nasal prong module of any one of the preceding aspects. The nasal prong module may be arranged to be removably coupled to the frame.

[0255] The nasal cannula may comprise a coupling member for receiving the flow of respiratory gases for supply to or through the frame, the coupling member arranged to be rotatably coupled with the frame.

[0256] In a fifteenth aspect, a nasal cannula assembly may comprise: the nasal cannula of any one of the preceding aspects; at least one inlet conduit arranged to be coupled with any one or both of the coupling member and the frame, and to receive the flow of respiratory gases for supply to the coupling member and/or the frame; and a headgear arranged to be removably and/or adjustably coupled with the frame and to extend around a rear of a head of the patient to secure the frame in position on the head.

[0257] The inlet conduit may comprise a tubing that is at least partially formed from a breathable material.

[0258] The nasal cannula assembly may comprise a nasal prong module configured to be removably coupled with the frame.

[0259] In a sixteenth aspect, a method of configuring a nasal cannula assembly for use in a respiratory support system is provided. The respiratory support system may be arranged to deliver a flow of respiratory gases to an upper airway of a patient. The method may comprise: selecting a nasal prong module from among a plurality of nasal prong modules with different nasal prong geometries; and removably coupling the selected nasal prong module with a frame of the nasal cannula assembly.

[0260] The plurality of nasal prong modules may comprise one or more nasal prong modules comprising an asymmetric nasal prong geometry.

[0261] Selecting the nasal prong module may comprise selecting from the plurality of nasal prong modules a first nasal prong module.

[0262] The method may comprise substituting the first nasal prong module for a second nasal prong module by decoupling the first nasal prong module from the frame and removably coupling the second nasal prong module to the frame.

[0263] The first nasal prong module may comprise a first nasal prong arranged to extend into a left nostril of the patient and form a first left nasal prong, and a second nasal prong arranged to extend into a right nostril of the patient and form a first right nasal prong. The first nasal prong geometry may be or may form a left asymmetric nasal prong geometry such that, an internal transverse dimension or cross-sectional area of the first left nasal prong is greater than a corresponding internal transverse dimension or cross-sectional area of the first right nasal prong, and/or an external transverse dimension or cross-sectional area of the first left nasal prong is greater than a corresponding external transverse dimension or cross-sectional area of the first right nasal prong. The first left nasal prong may be arranged to provide a greater volumetric flow rate than the first right nasal prong.

[0264] the second nasal prong module may comprise a first nasal prong arranged to extend into a left nostril of the patient and form a second left nasal prong, and a second nasal prong arranged to extend into a right nostril of the patient and form a second right nasal prong. The second nasal prong geometry may be or may form a left asymmetric nasal prong geometry such that, an internal transverse dimension or cross-sectional area of the second left nasal prong is greater than a corresponding internal transverse dimension or cross-sectional area of the second right nasal prong, and/or an external transverse dimension or cross-sectional area of the first second nasal prong is greater than a corresponding external transverse dimension or cross-sectional area of the second right nasal prong. The second left nasal prong may be arranged to provide a greater volumetric flow rate than the second right nasal prong.

[0265] The internal transverse dimension or cross-sectional area of the first left nasal prong may be greater than the internal transverse dimension or cross-sectional area of the second left nasal prong. Additionally or alternatively, the external transverse dimension or cross-sectional area of the first left nasal prong may be greater than the external transverse dimension or cross-sectional area of the second left nasal prong.

[0266] Selecting the nasal prong module may comprise selecting between any two or more of: a first nasal prong module comprising a left asymmetric nasal prong geometry,

a second nasal prong module comprising a right asymmetric nasal prong geometry, a third nasal prong module comprising a symmetric nasal prong geometry, and/or a fourth nasal prong module comprising a symmetric nasal prong geometry different to that of the third nasal prong module.

[0267] The method may comprise: selecting a type or variant of therapy for the patient from among a plurality of different types or variants of therapy; and selecting the nasal prong module based, at least in part, on the selected type or variant of therapy.

[0268] The plurality of different types or variants of therapy may comprise an asymmetric nasal high flow therapy and a symmetric nasal high flow therapy.

[0269] The plurality of different types or variants of therapy may comprise a left asymmetric nasal high flow therapy and a right asymmetric nasal high flow therapy.

[0270] The method may comprise: selecting between a left side entry or a right side entry for the flow of respiratory gases into the nasal cannula assembly; and configuring the nasal cannula assembly for the left side entry or the right side entry.

[0271] Selecting between the left side entry and the right side entry may be based, at least in part, on the selected nasal prong module.

[0272] Selecting the nasal prong module may be based, at least in part, on the selection between the left side entry and the right side entry.

[0273] The selected nasal prong module may comprise a pair of nasal prongs with an asymmetric nasal prong geometry, the method comprising configuring the nasal cannula assembly so that a larger one of the pair of nasal prongs is downstream of a smaller one of the pair of nasal prongs.

[0274] Selecting between the left side entry and the right side entry may comprise: selecting the left side entry if the selected nasal prong module comprises a right asymmetric nasal prong geometry; selecting the right side entry if the selected nasal prong module comprises a left asymmetric nasal prong geometry; or selecting either of the left side entry or the right side entry if the selected nasal prong module comprises a symmetric nasal prong geometry.

[0275] The method may comprise removing an existing nasal prong module from the frame of the nasal cannula assembly before removably coupling the selected nasal prong module with the frame.

[0276] The selected nasal prong module may comprise a different nasal prong geometry to that of the existing nasal prong module.

[0277] The selected nasal prong module may be arranged to provide a different type or variant of therapy than the existing nasal prong module.

[0278] The nasal cannula assembly may comprise a frame and a coupling member, the method comprising reconfiguring the nasal cannula assembly between a left side entry and a right side entry by rotating the coupling member with respect to frame.

[0279] In a seventeenth aspect, a method of reconfiguring a respiratory support system, or a nasal cannula assembly for use in the respiratory support system, to provide a different variant of nasal high flow therapy to a patient is provided. The respiratory support system may be arranged to deliver a flow of respiratory gases to an upper airway of the patient. The method may comprise: removing a first nasal prong module from a frame of the nasal cannula assembly, the first nasal prong module comprising one or more of a first left nasal prong arranged to extend into a left nostril of the patient or a first right nasal prong arranged to extend into a right nostril of the patient, the first nasal prong module comprising a first nasal prong geometry; and removably coupling a second nasal prong module with the frame of the nasal cannula assembly, the second nasal prong module comprising one or more of a second left nasal prong arranged to extend into the left nostril of the patient or a second right nasal prong arranged to extend into the right nostril of the patient, the second nasal prong module comprising a second nasal prong geometry different to the first nasal prong geometry.

[0280] The first nasal prong geometry may form one of a symmetric nasal prong geometry or an asymmetric nasal prong geometry. The second nasal prong geometry may form the other of the symmetric nasal prong geometry or the asymmetric nasal prong geometry.

[0281] The first nasal prong module may be arranged to provide one of a symmetric nasal high flow therapy or an asymmetric nasal high flow therapy. The second nasal prong module may be arranged to provide the other of the symmetric nasal high flow therapy or the asymmetric nasal high flow therapy.

[0282] The method may comprise reconfiguring the respiratory support system or the nasal cannula assembly: from a symmetric high flow respiratory support system or a symmetric high flow nasal cannula assembly arranged to provide symmetric nasal high flow therapy, to an asymmetric high flow respiratory support system or an asymmetric high flow nasal cannula assembly arranged to provide asymmetric nasal high flow therapy; or from an asymmetric high flow respiratory support system or an asymmetric high flow nasal cannula assembly arranged to provide asymmetric nasal high flow therapy, to a symmetric high flow respiratory support system or a symmetric high flow nasal cannula assembly arranged to provide symmetric nasal high flow therapy.

[0283] The first nasal prong module may be associated with a first therapy, the second nasal prong module may be associated with a second therapy, and removing the first nasal prong module and removably coupling the second nasal prong module may reconfigure the respiratory support system to provide the second therapy without requiring a change to any settings of a gases source of the respiratory support system.

[0284] The method may comprise reusing the frame and any one or more of: a coupling member of the nasal cannula assembly, the coupling member arranged to be coupled with the frame; at least one inlet conduit of the nasal cannula assembly, the inlet conduit arranged to be coupled with the coupling member; at least one coupling member connector of the nasal cannula assembly, the coupling member connector arranged to couple the inlet conduit with the coupling member; at least one swivel connector of the nasal cannula assembly, the swivel connector arranged to couple the inlet conduit with an inspiratory conduit of the respiratory support; or a headgear of the nasal cannula assembly, the headgear arranged to be removably and/or adjustably coupled with the frame and to extend around a rear of a head of the patient to secure the frame in position on the head.

[0285] The nasal cannula assembly may comprise a frame and a coupling member, the method comprising reconfiguring the nasal cannula assembly between a left side entry and a right side entry by rotating the coupling member with respect to the frame.

[0286] The method may comprise rotating the coupling member about an axis lying within a sagittal plane of the nasal cannula assembly.

[0287] The method may comprise rotating the coupling member by 180 °.

[0288] The method may comprise: reconfiguring the nasal cannula from the left side entry to the right side entry by rotating the coupling member in a first direction, or reconfiguring the nasal cannula from the right side entry to the left side entry by rotating the coupling member in a second direction, wherein the second direction is opposite to the first direction.

[0289] In an eighteenth aspect, a method of configuring a nasal cannula assembly for use in a respiratory support system is provided. The respiratory support system may be arranged to deliver a flow of respiratory gases to an upper airway of the patient. The nasal cannula assembly may comprise a coupling member configured to receive the flow of respiratory gases and supply the flow of respiratory gases to, or through, the frame for delivery to the patient. The method may comprise reconfiguring the nasal cannula assembly between a first operational configuration, in which the coupling member is arranged to receive the flow of respiratory gases from a first side of the nasal cannula assembly, and a second operational configuration, in which the coupling member is

arranged to receive the flow of respiratory gases from a second side of the nasal cannula assembly, by rotating the coupling member with respect to the frame.

[0290] The method may comprise rotating the coupling member about an axis lying within a sagittal plane of the nasal cannula assembly.

[0291] The method may comprise rotating the coupling member by 180 °.

[0292] The method may comprise: reconfiguring the nasal cannula from the left side entry to the right side entry by rotating the coupling member in a first direction, or reconfiguring the nasal cannula from the right side entry to the left side entry by rotating the coupling member in a second direction, wherein the second direction is opposite to the first direction.

[0293] The method may comprise selecting between the first operational configuration and the second operational configuration based, at least in part, upon a geometry of a pair of nasal prongs of the nasal cannula assembly.

[0294] In a nineteenth aspect, a nasal cannula for use in a respiratory support system arranged to deliver a flow of respiratory gases to an upper airway of a patient is provided. The nasal cannula comprises a frame and a coupling member arranged to be removably or permanently mechanically coupled with the frame. The coupling member comprises a gas inlet configured to be mechanically and fluidly coupled with an inlet conduit for receiving the flow of respiratory gases, a first gas outlet for supplying at least a portion of the received gas flow via or through the frame to a first nasal prong and a second gas outlet for supplying at least a portion of the received gas flow via or through the frame to a second nasal prong. The coupling member may comprise a coupling member connector via which the inlet conduit may be mechanically and fluidly coupled to the coupling member. The coupling member connector may be formed integrally with the remaining coupling member. Alternatively, the coupling member connector may be a separate component, which may be coupled to the remaining coupling member.

[0295] The gas inlet may be the only gas inlet of the coupling member and the first and second gas outlets may be the only gas outlets of the coupling member.

[0296] The nasal cannula may be arranged to mechanically couple the coupling member to the frame in a first operational configuration and in a second operational configuration. The second operational configuration may be different from the first operational configuration. The first and second operational configurations may refer to relative orientations of the coupling member and the frame with respect to each other.

The second operational configuration may be a mirror image of the first operational configuration.

[0297] The coupling member and the frame may be rotationally coupled to rotate with respect to each other about a common axis between the first operational configuration and the second operation configuration. The coupling member and the frame may be rotationally coupled via a swivel bearing, which may be formed by a pin. The coupling between the coupling member and the frame via the common axis may allow for a relative rotatability between the coupling member and the frame of at least 180 degrees. This may allow for a side switching of an inlet conduit from the right to the left side of the nasal cannula. Alternatively, the coupling member and the frame may be configured to allow for an engagement of the coupling member and the frame only in certain specific relative orientations. To change the relative orientation, it may be necessary to disengage the coupling member from the fame and reengage both components in a different relative orientation.

[0298] The common axis may be substantially normal to the face or head of a patient when the nasal cannula is fitted to the patient. The first and second gas outlets may be substantially normal to the face or head of a patient when the nasal cannula is fitted to the patient.

[0299] The common axis may be centrally located on any one or both of the frame and the coupling member. The common axis may be within a sagittal plane of a patient when the nasal cannula is fitted to the patient.

[0300] The common axis, the first gas outlet and the second gas outlet may be spaced apart from each other. That may mean that none of the common axis, the first gas outlet and the second gas outlet are coaxial to each other.

[0301] The first and second gas outlets may be positioned on opposite sides of the common axis, e.g. on a right side and the left side of the common axis, respectively.

[0302] The nasal cannula may comprise a retention mechanism arranged to removably or reversibly retain the frame and the coupling member in any one of the first operational configuration and the second operational configuration.

[0303] The coupling member may be configured to redirect the gas flow from the gas inlet to the first and second gas outlets by more than 95 degrees, optionally more than 100 degrees. In one embodiment, the coupling member may redirect the gas flow from the gas inlet to the first and second gas outlets by an angle between 110 degrees and 130 degrees. The redirection of the gas flow by said angle may mean that the main flow direction of the gas flow is changed, e.g. turned and/or angled, by said angle. The gas

inlet may be angled towards the head of a patient when the nasal cannula is fitted to the patient. The gas inlet may be angled with respect to the main extension direction, e.g. a longitudinal axis, of the coupling member towards the head of the patient.

[0304] The frame may comprise a first inlet opening for being fluidically coupled with the first gas outlet of the coupling member and a second inlet opening for being fluidically coupled with the second gas outlet of the coupling member. The fluid coupling between the openings may only be present in certain operational configurations of the nasal cannula. In other operational configurations, there may not be any fluid coupling between said openings.

[0305] For example, in the first operational configuration, the first inlet opening of the frame may be fluidically coupled to the first gas outlet of the coupling member and the second inlet opening of the frame may be fluidically coupled to the second gas outlet of the coupling member. In the second operational configuration, the first inlet opening of the frame may be fluidically coupled to the second gas outlet of the coupling member and the second inlet opening of the frame may be fluidically coupled to the first gas outlet of the coupling member.

[0306] The nasal cannula may further comprise a headgear arranged to be removably and/or adjustably coupled with the frame and to extend around a rear of a head of the patient to secure the frame in position on the head.

[0307] The nasal cannula may further comprise the first nasal prong and the second nasal prong.

[0308] The nasal cannula may be configured to deliver at least one of an asymmetric and a symmetric flow of respiratory gases to a patient at the first and the second nasal prongs.

[0309] The nasal cannula may form an asymmetric nasal prong geometry, such that: an internal transverse dimension or cross-sectional area of the first nasal prong is different to a corresponding internal transverse dimension or cross-sectional area of the second nasal prong; and/or an external transverse dimension or cross-sectional area of the first nasal prong is different to a corresponding external transverse dimension or cross-sectional area of the second nasal prong. Alternatively, the nasal cannula may form a symmetric nasal prong geometry.

[0310] The nasal cannula may further comprise a nasal prong module comprising the first nasal prong and the second nasal prong, the nasal prong module comprising a first gases inlet aperture and a second gases inlet aperture, wherein the first nasal prong is fluidly, such as pneumatically, coupled with the first gases inlet aperture and the second

nasal prong is fluidly, such as pneumatically, coupled with the second gases inlet aperture. The nasal prong module may be configured according to any one of the embodiments of this disclosure.

[0311] The nasal prong module may comprise a first gas carrying portion fluidly, such as pneumatically, coupled with the first gases inlet aperture and the first nasal prong, and a second gas carrying portion fluidly, such as pneumatically, coupled with the second gases inlet aperture and the second nasal prong. The first gas carrying portion and the second gas carrying portion may be separate from each other. Accordingly, the nasal prong module may provide two separate fluid paths, one for the first nasal prong and a second for the second nasal prong.

[0312] The frame of the nasal cannula may comprise a first outlet opening fluidly coupled with the first inlet opening of the frame and the first gases inlet aperture of the nasal prong module and a second outlet opening fluidly coupled with the second inlet opening of the frame and the second gases inlet aperture of the nasal prong module.

[0313] The nasal prong module may be arranged to be removably coupled to the frame. The frame and the nasal prong module may be arranged to be removably coupled adjacent a posterior side of the frame. The frame and the coupling member may be arranged to be removably or permanently coupled adjacent an anterior side of the frame. Accordingly, the nasal prong module and the coupling member may be coupled to opposite sides of the frame.

[0314] In a twentieth aspect, a nasal cannula system comprising a nasal cannula with a first nasal prong module according to one of the embodiments of the nineteenth aspect and a second nasal prong module is provided. The second nasal prong module may comprise a first nasal prong and a second nasal prong, wherein the first and the second nasal prongs of the first nasal prong module form a first nasal prong geometry and the first and the second nasal prongs of the second nasal prong module form a second nasal prong geometry. The first nasal prong geometry may be different from the second nasal prong geometry.

[0315] In a twenty-first aspect, a nasal prong module for use in a nasal cannula of a respiratory support system arranged to deliver a flow of respiratory gases to an upper airway of a patient is provided. The nasal prong module comprises a base portion comprising one or more coupling structures arranged to removably engage and/or cooperate with one or more corresponding attachment structures of a frame of the nasal cannula, e.g. of the frame of the twenty-second aspect disclosed below. The frame is arranged to support the nasal prong module in position, e.g., at an upper lip region of the patient. The nasal prong module comprises a body portion coupled or integrally

formed with the base portion, and a first nasal prong coupled with and extending from the body portion and/or a second nasal prong coupled with and extending from the body portion. The body portion is arranged to receive the flow of respiratory gases for delivery to the upper airway of the patient via any one or both of the first nasal prong and the second nasal prong. The one or more coupling structures of the base portion are arranged to torque-proofly couple the base portion to the frame by moving the base portion and the frame towards each other in at least one of the anterior direction and the posterior direction. The anterior and posterior directions may be defined with respect to a state when the nasal cannula is fitted to the patient in the intended fashion. Accordingly, by moving the base portion and the frame translationally towards each other in at least one of the anterior direction and the posterior direction, the base portion and the frame may be mechanically coupled to each other. In an embodiment, said mechanical coupling may be provided by only moving the base portion and the frame translationally towards each other in at least one of the anterior direction and the posterior direction, wherein no further actions may be required by a user. Said mechanical coupling is a torque-proof coupling such that, when coupled to each other, the base portion and the frame may not be rotated with respect to each other. Said mechanical coupling may also be a coupling that fixates the base portion and the frame rigidly to each other to not allow any relative movements therebetween, neither rotary nor translationally. Said mechanical coupling is a removable coupling such that the frame and the base portion may be non-destructively, e.g. tool-free, released from each other during the intended use of the nasal prong module.

[0316] The one or more coupling structures of the base portion may be arranged to be removably coupled with the one or more corresponding attachment structures of the frame in a removable snap fit. The snap fit may be arranged to provide any one or more of: tactile feedback, audible feedback, and visual feedback.

[0317] The one or more of the coupling structures may be arranged to resiliently deflect and at least partially recover as the base portion is coupled with the frame.

[0318] The one or more coupling structures may project in an anterior direction, away from the body portion. The anterior direction may be defined with respect to a state where the nasal cannula is fitted to the head of a patient in the intended fashion. The one or more coupling structures may each be bisected by a sagittal plane of the nasal prong module.

[0319] Each of the one or more coupling structures may comprise a protrusion arranged to engage or mate with a recess or underside portion of the respective one or more attachment structures of the frame. The protrusions may be located on inward surfaces at or proximate distal ends of the one or more coupling structures.

[0320] The nasal prong module (e.g., the base portion) may be arranged to couple with the frame in only a single orientation. At least one of the coupling structures may comprise at least one slot arranged to cooperate with at least one corresponding protrusion of the frame.

[0321] The nasal prong module (e.g., the base portion) may comprise a pair of coupling structures arranged to cooperate with a corresponding pair of attachment structures of the frame. The pair of coupling structures may be located in an opposing relationship, e.g. at the top and at the bottom of the base portion.

[0322] The pair of coupling structures may comprise a first coupling structure and a second coupling structure, the first coupling structure comprising a first coupling structure geometry and the second coupling structure comprising a second coupling structure geometry different to the first coupling structure geometry. The first coupling structure may be wider than the second coupling structure.

[0323] The base portion may comprise a first gases inlet aperture and a second gases inlet aperture arranged to receive the flow of respiratory gases for supply to the body portion and any one or both of the first nasal prong and the second nasal prong. The first nasal prong may be fluidly, such as pneumatically, coupled with the first gases inlet aperture and the second nasal prong may be fluidly, such as pneumatically, coupled with the second gases inlet aperture.

[0324] The body portion may comprise a first gas carrying portion fluidly, such as pneumatically, coupled with the first gases inlet aperture and the first nasal prong, and a second gas carrying portion fluidly, such as pneumatically, coupled with the second gases inlet aperture and the second nasal prong. The first gas carrying portion and the second gas carrying portion may be separate from each other.

[0325] In a twenty-second aspect, a frame for a nasal cannula for use in a respiratory support system arranged to deliver a flow of respiratory gases to an upper airway of a patient is provided. The frame is arranged to support a nasal prong module in position, e.g. a nasal prong module according to the twenty-first aspect. The frame comprises one or more attachment structures arranged to removably engage and/or cooperate with one or more corresponding coupling structures of the nasal prong module. The one or more attachment structures may be formed by at least one of a recess, a pocket, a cutout and a depression. The one or more attachment structures of the frame are arranged to torque-proofly couple the frame to the nasal prong module by moving the base portion and the frame towards each other in at least one of the anterior direction and the posterior direction. The anterior and posterior directions may be defined with respect to a state when the nasal cannula is fitted to the patient in the intended fashion.

Accordingly, by moving the nasal prong module and the frame translationally towards each other in at least one of the anterior direction and the posterior direction, the nasal prong module and the frame may be mechanically coupled to each other. In an embodiment, said mechanical coupling may be provided by only moving the nasal prong module and the frame translationally towards each other in at least one of the anterior direction and the posterior direction, wherein no further actions may be required by a user. Said mechanical coupling is a torque-proof coupling such that, when coupled to each other, the nasal prong module and the frame may not be rotated with respect to each other. Said mechanical coupling may also be a coupling that fixates the nasal prong module and the frame rigidly to each other to not allow any relative movements therebetween, neither rotary nor translationally. Said mechanical coupling is a removable coupling such that the frame and the nasal prong module may be non-destructively, e.g. tool-free, released from each other during the intended use of the frame. The frame comprises an outlet opening arranged to fluidly, such as pneumatically, couple with a gases inlet aperture of the nasal prong module for delivery of the flow of respiratory gases to the upper airway of the patient via the nasal prong module.

[0326] The one or more attachment structures may be arranged to be removably coupled with the one or more corresponding coupling structures of the nasal prong module in a removable snap fit. The snap fit may be arranged to provide any one or more of: tactile feedback, audible feedback, and visual feedback.

[0327] Each of the one or more attachment structures may comprise a recess or underside portion arranged to engage or mate with a protrusion of the respective one or more coupling structures of the nasal prong module.

[0328] The frame may be arranged to couple with the nasal prong module in only a single orientation. The frame may comprise a protrusion arranged to cooperate with a slot of at least one of the coupling structures of the nasal prong module.

[0329] The frame may comprise a pair of attachment structures arranged to cooperate with a corresponding pair of coupling structures of the nasal prong module. The pair of attachment structures may be located in an opposing relationship, e.g. at the top and at the bottom of the frame.

[0330] The pair of attachment structures may comprise a first attachment structure and a second attachment structure, the first attachment structure comprising a first attachment structure geometry and the second attachment structure comprising a second attachment structure geometry different to the first attachment structure

geometry. The first attachment structure may be wider than the second attachment structure.

[0331] The frame may comprise a first outlet opening arranged to fluidly, such as pneumatically, couple with a first gases inlet aperture of the nasal prong module and a second outlet opening arranged to fluidly, such as pneumatically, couple with a second gases inlet aperture of the nasal prong module.

[0332] The frame may comprise a headgear arranged to be removably and/or adjustably coupled with the frame and to extend around a rear of a head of the patient to secure the frame in position on the head.

[0333] In a twenty-third aspect, a nasal cannula comprising a frame according to the twenty-second aspect and a coupling member arranged to be removably or permanently mechanically coupled with the frame is provided. The coupling member comprises a gas inlet configured to be mechanically and fluidly coupled with an inlet conduit for receiving the flow of respiratory gases and a gas outlet opening for supplying at least a portion of the received gas flow to an inlet opening of the frame. The inlet opening of the frame is fluidly, such as pneumatically, coupled with the outlet opening of the frame.

[0334] The coupling member may comprise a first gas outlet for supplying at least a portion of the received gas flow to a first inlet opening of the frame, which is fluidly, such as pneumatically, coupled with first outlet opening of the frame, and a second gas outlet for supplying at least a portion of the received gas flow to a second inlet opening of the frame, which is fluidly, such as pneumatically, coupled with the second outlet opening of the frame.

[0335] In a twenty-fourth aspect, a kit of parts for a nasal cannula assembly is provided. The kit of parts comprises a nasal prong module according to the twenty-first aspect, and a frame according to the twenty-second aspect or a nasal cannula according to the twenty-third aspect. In the kit of parts, the nasal prong module may be provided either mechanically coupled to or decoupled from the frame or the nasal cannula.

[0336] Further aspects will be apparent from the following detailed description and accompanying drawings of non-limiting examples of the present technology.

BRIEF DESCRIPTION OF THE DRAWINGS

[0337] To easily identify the discussion of any particular element, the most significant digit or digits in a reference numeral refer to the figure number in which that element is first introduced. The same reference numeral may refer to the same or similar elements in different examples. Except as explicitly described, shown in the drawings,

or otherwise apparent to a person skilled in the art, the description of an element and variants in one example is intended to apply equally to any other examples comprising that element.

[0338] FIG. 1 illustrates a respiratory support system according to a first example.

[0339] FIG. 2 illustrates a respiratory support system according to a second example.

[0340] FIG. 3 shows an example of a nasal cannula assembly comprising a nasal cannula, an inlet conduit, and headgear, fitted to a patient.

[0341] FIG. 4 shows a front isometric view of an example nasal cannula.

[0342] FIG. 5 shows a bottom isometric view of the nasal cannula of FIG. 4.

[0343] FIG. 6 shows an exploded front isometric view of the nasal cannula of FIG. 4 and FIG. 5.

[0344] FIG. 7 shows another exploded isometric view of the nasal cannula of FIG. 4 to FIG. 6.

[0345] FIG. 8 shows yet another exploded isometric view of the nasal cannula of FIG. 4 to FIG. 7.

[0346] FIG. 9 shows a rear isometric view of the nasal prong module of the nasal cannula of FIG. 4 to FIG. 8.

[0347] FIG. 10 shows an exploded front isometric view of the nasal prong module of FIG. 9.

[0348] FIG. 11 shows a bottom isometric view of nasal prong module of FIG. 9 and FIG. 10.

[0349] FIG. 12 shows a top view of the arrangement of nasal prongs of FIG. 9 to FIG. 11.

[0350] FIG. 13 shows a first side, e.g., a right side, of the nasal prong module of FIG. 9 to FIG. 12.

[0351] FIG. 14 shows a front view of the nasal prong module of FIG. 9 to FIG. 13.

[0352] FIG. 15 shows a second side, e.g., a left side, of the nasal prong module of FIG. 9 to FIG. 14.

[0353] FIG. 16 shows a bottom view of the nasal prong module of FIG. 9 to FIG. 15.

[0354] FIG. 17 shows an isometric cross-sectional view of the nasal prong module of FIG. 9 to FIG. 16.

[0355] FIG. 18 shows a side cross-sectional view of the nasal prong module of FIG. 9 to FIG. 17.

[0356] FIG. 19 shows a further isometric cross-sectional view of the nasal prong module of FIG. 9 to FIG. 18.

[0357] FIG. 20 shows a further side cross-sectional view of the nasal prong module of FIG. 9 to FIG. 19.

[0358] FIG. 21 shows yet a further isometric cross-sectional view of the nasal prong module of FIG. 9 to FIG. 20.

[0359] FIG. 22 shows yet a further side cross-sectional view of the nasal prong module of FIG. 9 to FIG. 21.

[0360] FIG. 23 shows a rear isometric view of another example of a nasal prong module suitable for use in the nasal cannula of FIG. 4 to FIG. 8.

[0361] FIG. 24 shows an exploded isometric view of the nasal prong module of FIG. 23.

[0362] FIG. 25 shows a bottom isometric view of the nasal prong module of FIG. 23 and FIG. 24.

[0363] FIG. 26 shows a rear isometric view of another example of a nasal prong module suitable for use in the nasal cannula of FIG. 4 to FIG. 8.

[0364] FIG. 27 shows an exploded isometric view of the nasal prong module of FIG. 26.

[0365] FIG. 28 shows a rear isometric view of the nasal prong module of FIG. 26 and FIG. 27.

[0366] FIG. 29 shows a front isometric view of another example of a nasal prong module suitable for use in the nasal cannula of FIG. 4 to FIG. 8.

[0367] FIG. 30 shows an exploded isometric view of the nasal prong module of FIG. 29.

[0368] FIG. 31 shows a rear isometric view of the nasal prong module of FIG. 29 and FIG. 30.

[0369] FIG. 32 shows an isometric view of an example of a nasal prong module suitable for use in the nasal cannula of FIG. 4 to FIG. 8.

[0370] FIG. 33 shows a cross-sectional isometric view of the nasal prong module of FIG. 32.

[0371] FIG. 34 shows a cross-sectional isometric view of the nasal prong module of FIG. 32 and FIG. 33.

[0372] FIG. 35 shows a sectional exploded isometric view of the nasal prong module of FIG. 32 to FIG. 34 and the frame.

[0373] FIG. 36 shows a cross-sectional side view of the frame of the nasal cannula of FIG. 4 to FIG. 8.

[0374] FIG. 37 shows a sectional exploded isometric view of an example of a nasal cannula comprising an example of a nasal prong module, a frame, a coupling member and a coupling member connector.

[0375] FIG. 38 shows an isometric view of the frame of FIG. 37.

[0376] FIG. 39 shows an isometric view of the coupling member and coupling member connector of FIG. 37.

[0377] FIG. 40 shows a side view of the coupling member and coupling member connector of FIG. 37 and FIG. 39.

[0378] FIG. 41 shows an isometric view of the coupling member of FIG. 37, FIG. 39 and FIG. 40.

[0379] FIG. 42 shows an isometric view of an example of a coupling member and a coupling member connector.

[0380] FIG. 43 shows a side view of the coupling member and coupling member connector of FIG. 42.

[0381] FIG. 44 shows a cross-sectional view of an example of a coupling member.

[0382] FIG. 45 shows a cross-sectional view of an example of a frame.

[0383] FIG. 46 shows a sectional isometric view of an example of a nasal cannula assembly comprising an example of a coupling member, coupling member connector, tubing clip, inlet conduit and connector.

[0384] FIG. 47 shows a sectional exploded view of an example of a frame and tubing clip.

DETAILED DESCRIPTION

[0385] The disclosure relates to a nasal cannula system and a nasal cannula assembly, e.g., comprising a removable nasal prong module, for use in a respiratory support system arranged to provide high flow therapy (HFT) to a patient.

[0386] Nasal high flow (NHF) therapy is a particular form of HFT in which the flow of respiratory gases is delivered to the patient, e.g., to the patient's upper airway. The flow of respiratory gases may be delivered by a nasal cannula. The nasal cannula is typically secured on the head of the patient, e.g., below the nose, such as in the region of the philtrum and/or nasolabial sulci. A pair of nasal prongs may extend into the patient's nostrils/nares. The nasal prongs generally do not occlude or seal the nostrils, so that expiratory gases and/or excess respiratory gases may exit to ambient around the nasal prongs.

[0387] HFT and/or NHF therapy may be alternatively known by a variety of other terms such as High Flow Nasal Cannula (HFNC) therapy, High Flow Nasal Oxygen (HFNO) therapy, High Flow Oxygen Therapy (HFOT), OptiFlow™ (a trademark of Fisher & Paykel Healthcare Limited), Trans-Nasal Insufflation (TNI™, a trademark of TNI Medical AG), or High Velocity Therapy (HVT™, a trademark of Vapotherm, Inc.), for example.

Respiratory Support System

[0388] FIG. 1 illustrates a respiratory support system 100 according to a first example. The respiratory support system 100 may be arranged or operable to provide respiratory therapy to a patient, e.g., via a patient interface. The respiratory therapy may be HFT, such as NHF therapy. The patient interface may be a nasal cannula, e.g., with non-sealing nasal prongs.

[0389] The respiratory support system 100 may comprise a respiratory support apparatus. The respiratory support apparatus may comprise a gases source 110. The gases source 110 may be arranged to provide a controlled flow of respiratory gases. The gases source 110 in the illustrated example may be a mechanical ventilator arranged to provide NHF therapy. The flow of respiratory gases may be provided to the

patient at a controlled flow rate. In some examples, at flow rates of up to about 70 liters per minute (l/min).

[0390] The respiratory support system 100, e.g., the respiratory support apparatus, may comprise a blower or flow generator. In some examples, the gases source 110 may comprise or be in the form of a blower/flow generator arranged to generate the flow of respiratory gases, e.g., from ambient air.

[0391] The respiratory support system 100, e.g., the gases source 110, may comprise a filter 114, e.g., coupled with a gases source outlet 112 of the gases source 110. The filter 114 may be arranged to filter particulates from the flow of respiratory gases.

[0392] The respiratory support system 100 may comprise a humidifier supply conduit 120 arranged to be coupled with the gases source outlet 112 of the gases source 110. Optionally, the humidifier supply conduit 120 may be coupled with the gases source outlet 112 via the filter 114, as shown in FIG. 1.

[0393] The respiratory support system 100, e.g., the respiratory support apparatus, may comprise a humidifier 130 arranged to heat and/or humidify the flow of respiratory gases. In some examples, the respiratory support apparatus comprises both the gases source 110, e.g., the blower/flow generator, and the humidifier 130, e.g., integrated into a single housing. In some examples, the respiratory support apparatus may be provided in the form of a stand-alone humidifier, e.g., comprising the humidifier 130. The humidifier 130 may receive the flow of respiratory gases from the gases source 110 (such as the blower/flow generator), e.g., via the humidifier supply conduit 120.

[0394] In some examples, the humidifier 130 may be an active passover-type humidifier. The humidifier 130 may comprise a humidifier base 132. The humidifier base 132 may comprise a chamber heater, e.g., a heating element and a heater plate. The humidifier base 132 may comprise a controller arranged to control the humidifier 130. Controlling the humidifier 130 may comprise controlling the chamber heater, e.g., to control and/or regulate one or more of a temperature or a humidity of the flow of respiratory gases as described in further detail below.

[0395] The humidifier 130 may comprise a humidification chamber 134. The humidification chamber 134 may be arranged to contain a reservoir of humidification liquid, e.g., water. The humidification chamber 134 may comprise a chamber inlet and a chamber outlet. The chamber inlet may be arranged to be coupled with the humidifier supply conduit 120. The humidification chamber 134 may be arranged to be removably engaged with the humidifier base 132, e.g., for refilling, cleaning, and/or replacement.

[0396] During operation of the respiratory support system 100, the flow of respiratory gases may be received through the chamber inlet of the humidification chamber 134, circulate within the headspace of the humidification chamber 134 where it is heated and/or humidified by the water and water vapor, then exit the humidification chamber 134 through the chamber outlet.

[0397] The humidifier 130 may be controlled so that the flow of respiratory gases is received by the patient at, or near, a target temperature and/or a target humidity. The target temperature and/or the target humidity may be adjustable, e.g., based on a user input. In some examples, the respiratory support system 100 may be arranged to deliver the flow of respiratory gases to the patient's upper airway at a temperature of about 31° Celsius (C) and a relative humidity of about 70%. The flow of respiratory gases may be further heated and humidified by the patient's upper airway to arrive at the patient's lungs at a temperature of about 37° C and a relative humidity of about 100%, emulating the approximate temperature and humidity within the lungs of a healthy adult human.

[0398] In yet other examples, the humidifier 130 may be, or comprise, a passive (unheated) passover-type humidifier, a heat and moisture exchanger (HME), a nebulizing humidifier, or a humidifier arranged to supply a continuous or periodic metered flow of humidifying liquid to a heating element for instantaneous or near-instantaneous vaporization.

[0399] The respiratory support system 100 may comprise an inspiratory conduit 140. At one end, the inspiratory conduit 140 may be coupled with an outlet of the respiratory support apparatus, such as an outlet of the humidifier 130 (e.g., the humidification chamber outlet), to convey the flow of respiratory gases towards the patient. At the other end, the inspiratory conduit 140 may be coupled to the patient interface to convey the flow of respiratory gases to the patient.

[0400] The inspiratory conduit 140 may comprise a pair of connectors 142, 144. The connector 142 may be arranged to be physically, fluidly (e.g., pneumatically) and/or electrically coupled with the respiratory support apparatus, such as the outlet of the humidifier 130 (e.g., the humidification chamber outlet). The connector 144 may be arranged to be physically and fluidly (e.g., pneumatically) coupled with the patient interface, e.g., a nasal cannula assembly. Either or both of the connectors 142, 144 may comprise a rotatable swivel to decouple rotational forces in the inspiratory conduit 140 from the humidifier 130 and/or nasal cannula assembly 150. Alternatively, the inspiratory conduit 140 may be directly and/or permanently coupled with the respiratory support apparatus and the patient interface.

[0401] The inspiratory conduit 140 may comprise a length of tubing 146. In some examples, the tubing 146 may extend between, and fluidly (e.g., pneumatically) connect to the respiratory support apparatus, e.g., directly/permanently or via connector 142, and to the patient interface, e.g., directly/permanently or via connector 144. The tubing 146 may be flexible and/or extensible. The tubing 146 comprises a tube wall defining a lumen for the passage of the flow of respiratory gases.

[0402] In some examples, the inspiratory conduit 140 may have an overall length of between about 0.5 and 2.5 meters (m) (measured at rest, without external forces applied).

[0403] In some examples, the inspiratory conduit 140 may be heated. The inspiratory conduit 140 may comprise one or more resistive heater wires. The inspiratory conduit 140 may be heated during operation of the respiratory support system 100. Heating the inspiratory conduit 140 may maintain or increase a temperature of the flow of respiratory gases within the inspiratory conduit 140, e.g., at or above dew point, or at least mitigate heat loss. Heating the inspiratory conduit 140 may inhibit, prevent, and/or dissipate condensation within the inspiratory conduit 140. The one or more heater wires may be embedded in the tubing 146. The one or more heater wires may be powered by the respiratory support apparatus, e.g., by the humidifier 130.

[0404] In other examples, the inspiratory conduit 140 may comprise a water jacket. Heated water may be circulated through the water jacket of the inspiratory conduit 140. The humidifier 130 may comprise a water pump to circulate the heated water. The heated water may be sourced from the water reservoir.

[0405] The inspiratory conduit 140 may comprise one or more sensors. In one example, the inspiratory conduit 140, e.g., connector 142, may comprise a sensor at a patient end of the inspiratory conduit 140. The sensor may be a temperature sensor, e.g., a thermistor. In some examples, the inspiratory conduit 140 may comprise a sensor at the chamber end of the inspiratory conduit 140, and/or at an intermediate location along the length of the inspiratory conduit 140.

[0406] The one or more sensors of the inspiratory conduit 140 may be electrically coupled with the humidifier 130 via the one or more heater wires. In one example, the one or more sensors, e.g., thermistor, may be coupled with a pair of heater wires, e.g., in parallel with a diode. In other examples, the inspiratory conduit 140 may comprise one or more sensor wires. The one or more sensors may be coupled with the humidifier 130 via the one or more sensor wires.

[0407] The respiratory support system 100 comprises a patient interface. The patient interface may be arranged to receive the flow of respiratory gases for supply to the patient. The patient interface may be arranged to be coupled with the inspiratory conduit 140. In the illustrated example, the patient interface is a nasal cannula assembly 150 arranged to supply the flow of respiratory gases, e.g., to the patient's upper airway via the patient's nostril(s).

[0408] The nasal cannula assembly 150 may comprise any one or more of the nasal cannula, nasal prong module, inlet conduit, and headgear as described below. The nasal cannula assembly 150 may be also referred to or may comprise a nasal cannula system (described in further detail below).

[0409] FIG. 2 illustrates a respiratory support system 200 according to a second example.

[0410] The respiratory support system 200 of FIG. 2 is generally similar to the respiratory support system 100 of FIG. 1. The respiratory support system 200 may comprise any one or more of the gases source 110 (which may comprise or be in the form of a blower/flow generator), humidifier 130, inspiratory conduit 140, and nasal cannula assembly 150. In some examples, the respiratory support system 200, e.g., respiratory support apparatus 210, comprises a housing comprising the humidifier 130. In some other examples, the respiratory support system 200, e.g., respiratory support apparatus 210, comprises the humidifier 130 and the gases source 110 (e.g., the blower/flow generator) in a single housing of the respiratory support apparatus 210. In the illustrated example of FIG. 2, the gases source 110 and humidifier 130 are provided integrated in a single housing of the respiratory support apparatus 210. In such arrangements, the humidifier supply conduit 120 may be replaced by internal ducting within the housing of the respiratory support apparatus 210.

[0411] Various components of the respiratory support apparatus 210, e.g., one or more of the patient/user interface, controllers, and sensors described above with respect to the respiratory support system 100 of FIG. 1, may be shared between the gases source 110 and humidifier 130 of the respiratory support apparatus 210. For example, a single controller may be arranged to control each of the gases source 110 (e.g., proportional solenoid valve, and/or blower), humidifier 130 (e.g., heater plate and/or pump), and inspiratory conduit 140 (e.g., heater wires). User inputs for control of the gases source 110, humidifier 130, and inspiratory conduit 140 may be received via a single user interface of the respiratory support apparatus 210.

[0412] In some examples, the respiratory support apparatus 210 may be an AIRVO™, AIRVO™ 2, AIRVO™ 3, myAirvo™, myAirvo™ 2, or myAirvo™ 3 nasal high flow system

available from Fisher & Paykel Healthcare. However, the nasal cannula systems and nasal cannula assemblies disclosed herein may be used with other devices, such as a wall gases source and/or a ventilator gases supply.

Nasal Cannula Assembly

[0413] FIG. 3 shows the nasal cannula assembly 150 of FIG. 1 and FIG. 2 in further detail, fitted to a patient. As shown in FIG. 3, the nasal cannula assembly 150 may comprise at least one inlet conduit 302 (also referred to as "interface tubing" or "interface tube"), a nasal cannula 304 and a headgear 306.

[0414] The nasal cannula 304 is arranged to receive the flow of respiratory gases from the at least one inlet conduit 302. The nasal cannula 304 may be arranged to deliver the flow of respiratory gases to the patient, e.g., the patient's upper airway. The nasal cannula 304 may be arranged to deliver the flow of respiratory gases through one or two nasal prongs, e.g., extending into the patient's respective nostrils. Further details of the nasal cannula 304 are described below.

Inlet conduit

[0415] The at least one inlet conduit 302 is arranged to be coupled with a respiratory support system to receive the flow of respiratory gases, e.g., the inspiratory conduit 140 of the respiratory support system 100 or respiratory support system 200, to receive a flow of respiratory gases, and to convey the flow of respiratory gases to the nasal cannula 304 for delivery to the patient.

[0416] Each of the at least one inlet conduit 302 may comprise at least one connector 308 and/or at least one connector 310. The connector 308 may be arranged to be physically, fluidly (e.g., pneumatically) and/or electrically coupled with the respiratory support system, e.g., inspiratory conduit 140. The connector 308 may be a swivel connector. A swivel connector may help decouple forces, e.g., rotational forces from the inspiratory conduit 140. The connector 310 may be arranged to be physically and fluidly (e.g., pneumatically) coupled with the nasal cannula 304, e.g., via a coupling member as described in further detail below.

[0417] In some examples, the connector 310 and/or nasal cannula 304 may be arranged so that the connector 310 may be selectively coupled with the nasal cannula 304 in at least two different orientations. For example, the connector 310 may be optionally coupled with the nasal cannula 304 so that the inlet conduit 302 extends from either of a left lateral side or, as shown in FIG. 3, a right lateral side of the nasal cannula 304. The different orientations may enable the inlet conduit 302 to be directed towards the patient's left side or, as shown, right side. Depending on one or more of patient

preference, location of the gases source 110 and/or humidifier 130, and/or the nasal prong geometry (as described in further detail below).

[0418] A nasal cannula assembly, which may be arranged to have the inlet conduit 302 extending from either the left or right lateral sides of the nasal cannula, may be referred to as a "side-swapping nasal cannula." Examples of suitable nasal cannulae and/or connectors are disclosed in WO2014/182179 and WO2015/193833, the entire contents of which are incorporated herein by reference.

[0419] In other examples, the inlet conduit 302 may be coupled, or arranged to couple, with the nasal cannula 304 in a single orientation. For example, at one of a left lateral side, a right lateral side, or centrally. The inlet conduit 302 may be permanently coupled to the nasal cannula 304, with or without the connector 310.

[0420] In yet other examples, the nasal cannula assembly 150 may comprise a pair of inlet conduits 302 or a bifurcated inlet conduit 302 coupled, or arranged to couple, with the nasal cannula 304, e.g., at opposing lateral sides of the nasal cannula 304 simultaneously.

[0421] The inlet conduit 302 may be arranged to be removably, fluidly and/or mechanically coupled with an inlet of the nasal cannula 304 in a single orientation (e.g., an inlet of any one or both of a coupling member and a frame of the nasal cannula 304 explained in further detail below). Alternatively, the inlet conduit 302 may be arranged to be removably coupled with the nasal cannula 304 (e.g., any one or both of the coupling member and the frame of the nasal cannula 304) in at least two different orientations, e.g., by coupling with one or more inlet(S) of any one or both of a coupling member and a frame.

[0422] The inlet conduit 302 may comprise a length of tubing 312 extending between, and fluidly (e.g., pneumatically) connecting, the connectors 308, 310. The tubing 312 may be flexible and/or extensible. Flexible and/or extensible tubing may help decouple forces, e.g., a tube drag force, such as from the inspiratory conduit 140.

[0423] The tubing 312 comprises a tube wall defining a lumen for the passage of the flow of respiratory gases. In some examples, the tube wall may comprise a helical rib and a membrane. The membrane may span between two or more adjacent windings of the helical rib. The membrane may be arranged to drape between adjacent windings of the helical rib when the tubing 312 is at rest, without any external forces applied. The membrane may be arranged to be drawn taut as the tubing 312 elongates in the axial direction. The membrane may limit extensibility of the helical rib and/or tubing 312.

[0424] In some examples, the tubing 312 may be at least partially formed from a breathable material. For example, the tube wall of the tubing 312, e.g., the membrane, may be at least partially formed from a vapor-permeable material, e.g., a breathable material.

[0425] "Breathable material" refers to a non-porous permeable material that allows the passage of water molecules through a monolithic wall of the permeable material via the solution-diffusion mechanism, without allowing the bulk passage of liquid water or bulk flow of respiratory gases all the way through the wall. The water molecules in the wall are molecularly dispersed in the media, and are therefore without a state (solid, liquid, or gas), although they are sometimes referred to in the art as vapor (e.g., the rate of transfer is often referred to as a moisture vapor transmission rate (MVTR) or the like). A monolithic wall does not contain open channels or pores from one major surface to another, such that pathogens could be carried through such channels alongside air or liquid water drops via the pore flow mechanism. However, this definition is not intended to exclude a tube formed from such a breathable material which may have one or more holes provided through the material, such as might arise from a manufacturing defect for example, which may result in negligible pore flow which does not materially affect the overall performance of the tube, e.g., compliance with the leakage requirements of ISO 5367:2014. Like all polymers, some small molecule transport of respiratory gases (such as oxygen, carbon dioxide, nitrogen or helium) may occur in trace or de minimis amounts (i.e., not "bulk" flow), which, for a breathable material as defined herein, would typically be at a rate at least an order of magnitude lower than that for water molecules. Furthermore, of particular relevance for respiratory gases being delivered to a patient, such small molecule transport of respiratory gases would be of an amount less than that allowed for compliance with the relevant standards, e.g., in the leakage test of ISO 5367:2014 at Section 5.4 tested via the method set out in Annex E.

[0426] The vapor-permeable material, e.g., breathable material, may allow the passage of water vapor/molecules from the lumen to ambient air, e.g., by the solution-diffusion mechanism. Therefore, the breathable material may provide the ability to reduce, mitigate, prevent, and/or dissipate condensation within the lumen.

[0427] As will be described in further detail below, certain types of patient interfaces, such as those with an asymmetric nasal prong geometries, may be used with a gas flow rate that is slower than other types of patient interfaces, such as those with a symmetric nasal prong geometries. Slower gas flow rate can result in a longer residence time for the gases within the tubing 312, which can increase the amount of condensation within the tubing 312. Thus, the tubing 312 having a tube wall that is at least partially formed from a breathable material can be advantageous for such applications, i.e., those having relatively slower gas flow rates, as it reduces the chance and/or amount of condensation.

[0428] Compared to the tubing 146 of the inspiratory conduit 140, the tubing 312 may have:

- smaller internal diameter (e.g., transverse diameter) or cross-sectional area or perimeter and/or external diameter (e.g., transverse diameter) or cross-sectional area or perimeter,
- shorter length,
- lower mass per unit length,
- lower overall mass, and/or
- greater flexibility and/or extensibility.

Headgear

[0429] As mentioned above, the nasal cannula assembly 150 may comprise a headgear, such as the headgear 306 shown in FIG. 3.

[0430] The headgear 306 may be arranged to be coupled with the nasal cannula 304 to secure the nasal cannula 304 in position on the head of the patient. The headgear 306 may be arranged to extend around the patient's head.

[0431] In some examples, the headgear 306 may be at least partially flexible. At least a portion of the headgear 306 may be stretchable. For example, at least a portion of the headgear 306 may be elastic.

[0432] The headgear 306 may be at least partially made from a multi-layer material. The multi-layer material may comprise one or more fabric layers. The multi-layer material may comprise one or more foam layers. The multi-layer material may comprise one or more fabric layers and one or more foam layers. For example, the multi-layer material may comprise two fabric layers and one foam layer in-between the two fabric layers.

[0433] The headgear 306 may be coupled to one or both ends of the nasal cannula 304. In some examples, the headgear 306 may be adjustably coupled to the nasal cannula 304, e.g., to adjust an effective length of the headgear 306 on the patient's head. For example, as will be described in further detail below, the nasal cannula 304 may comprise one or more headgear connecting portions, each arranged to, e.g., removably and adjustably, receive and retain a portion of the headgear 306. This may be achieved by any one or both of (a) a frictional engagement of the headgear 306 with

the one or more connecting portion of the nasal cannula 304 and (b) a fastening mechanism of the headgear 306, such as a hook and loop arrangement (e.g., Velcro®).

[0434] Alternatively or additionally, the headgear may comprise a buckle, e.g., arranged to be located at the rear of the patient's head, which allows a length of the headgear 306 to be adjusted.

[0435] In some examples, as shown in FIG. 3, the headgear 306 may be arranged to be coupled with the nasal cannula 304 on opposing sides of the patient's head, e.g., anteriorly of the respective ears, in the zygomatic region and/or temporal region of the patient's head. The headgear 306 may be arranged to extend from the nasal cannula 304 in a posterior and superior direction, passing between the patient's eye and ear on respective sides of the patient's head.

[0436] In some examples, the headgear 306 may comprise a single strap. In other examples, the headgear may comprise a pair of straps joined by a buckle, e.g., at a rear of the patient's head.

[0437] In yet other examples, the headgear 306 may comprise a central strap portion. In some examples, the central strap portion maybe be directly (and optionally adjustably) coupled to the nasal cannula 304. In some other examples, the headgear 306 may comprise first and/or second side strap portions attached to the central strap portion. The central strap portion may be arranged to be located generally around the back of the head of the patient (for example, over the parietal and/or occipital portions of the head).

[0438] In some examples, the headgear 306 may comprise upper and lower straps or strap portions, e.g., to cradle an upper rear of the patient's head. In some other examples, the central strap portion may comprise the upper and lower straps or strap portions. The upper and lower straps or upper strap portions may be bifurcated, e.g., branching from the first and/or second side strap portions. The first and/or second side strap portions may comprise a single strap.

[0439] The upper and lower straps or strap portions may be permanently and initially arranged separately (i.e., bifurcated). Alternatively, the upper and lower straps or side strap portions may be initially linked by one or more bridging sections. The one or more bridging sections may be arranged to be breakable or cleavable by a user, such that the straps are separable or bifurcatable. For example, the one or more bridging sections may be thin or structurally weak (e.g. the bridging sections may comprise a lower thickness, material strength, and/or structural integrity than the pair of straps), such that they may be broken if the pair of straps are forced apart.

[0440] The arrangement of the upper and lower straps or strap portions, e.g., being bifurcated or arranged separately, allows for each of the straps or strap portions (i.e., the upper and lower straps or strap portions) to move in relation to one another. The provided level of movement may allow the upper and lower straps or strap portions to support different regions of the head. For example, one of the upper and lower straps or strap portions may be used to support a mid-parietal section of the head and the other of the upper and lower straps or strap portions may be used to support a mid-occipital section of the head.

[0441] The upper and lower straps or strap portions may allow for a greater level of adaptability to different patient anatomies or for a greater level of patient comfort. The upper and lower straps or strap portions may also promote improved stability of the headgear 306 (e.g. by preventing excessive movement of the nasal cannula 304 away from the head of the patient).

[0442] In some examples, the central strap portion may comprise more than two straps or strap portions. For example, the central strap portion may comprise three or four straps or strap portions. In some such examples, some or all of adjacent pairs of the more than two straps may be initially separated or joined by bridging sections.

[0443] In some examples, a first portion and a second portion of the headgear 306, e.g., the first and second side strap portions attached to the central strap portion, are arranged to be located generally on a respective side of the head of the patient (for example, over cheek, zygomatic, temporal, and/or sphenoid portions of the head).

Nasal Cannula

[0444] FIG. 4 to FIG. 7 illustrate an example nasal cannula 400 in further detail. The nasal cannula 400 may be used in the nasal cannula assembly 150 of FIG. 1 to FIG. 3, e.g., as the nasal cannula 304.

[0445] The arrows in FIG. 4 illustrate various directions referred to throughout the disclosure, at least some of which are described from the perspective of an erect patient to whom the nasal cannula assembly may be fitted, and/or the illustrated orientation of the nasal cannula assembly or components. The arrow U represents the upward (or superior) direction. The arrow D represents the downward (or inferior) direction. It will be appreciated that, in use, the patient may be supine, for example. "Upward" and "downward" are not intended to necessarily imply a vertical direction when the nasal cannula assembly is in use. The arrow A represents the anterior direction. The arrow P represents the posterior direction. The arrow L represents the left direction. The arrow R represents the right direction. Thus the first nasal prong 406a may be regarded as a left nasal prong and the second nasal prong 406b may be regarded as a right nasal

prong, for example. The left direction and the right direction, collectively or individually, may be referred to as a lateral direction. And “laterally” may refer to one or both of the left direction and the right direction.

Frame and Coupling Member

[0446] The nasal cannula 400 may comprise a coupling member 404.

[0447] The at least one conduit 302 may be arranged to supply the flow of respiratory gases to or through the coupling member 404. The coupling member 404 may comprise one or more gas inlets for receiving the flow of respiratory gases. In some examples, each of the at least one inlet conduit 302 may be arranged to couple, e.g., fluidly, such as pneumatically, couple, with a respective gas inlet of the coupling member 404, e.g., via a respective coupling member connector 405.

[0448] In some examples, the coupling member 404 may comprise a main body 436. The main body 436 may be elongated. The coupling member 404, e.g., the main body 436, may comprise a first end and a second end. The first end and the second end of the coupling member 404, e.g., the main body 436, may be oppositely arranged. The coupling member 404 may comprise a gas inlet at or proximate to any one or both of the first end and the second end of the coupling member 404, e.g., the main body 436. The gas inlet(s) may each be arranged to be coupled to an inlet conduit 302, e.g., via a coupling member connector 405. In some examples, at least a portion of the coupling member 404, e.g., the main body 436, may comprise a u-shaped cross-section. In some examples, at least a portion of each coupling member connector 405 may comprise a u-shaped cross-section. The coupling member connector 405 may be the same as, or used instead of, the connector 310 described above.

[0449] In some examples, the coupling member connector 405 may be arranged to couple (e.g., removably couple) to the coupling member 404 at a first end of the coupling member connector 405. The coupling member 404 and the coupling member connector 405 may be coupled using a snap-fit connection. In some examples, the first end of the coupling member connector 405 may comprise a connection protrusion 448, examples of which are shown in FIG. 39, FIG. 40, FIG. 42 and FIG. 43. The connection protrusion 448 may be arranged to be inserted into a connection aperture 449 of the coupling member 404, e.g., to secure the coupling between the coupling member 404 and coupling member connector 405. The connection protrusion 448 may comprise a tapered or ramped portion. The tapered or ramped portion may initiate at a lower end and terminate at a higher end. The higher end may comprise a wall that may be at least substantially vertical. The wall may be arranged to abut against a surface of the connection aperture 449 to secure the coupling between the coupling member 404 and

the coupling member connector 405. The connection protrusion 448 may be arranged to enter the connection aperture 449 via the lower end.

[0450] In some examples, the coupling member connector 405 may be arranged to couple (e.g., removably couple) to a respective inlet conduit 302 at a second end of the coupling member connector 405. At least a portion of the second end (e.g., on an outer surface of the second end) of the coupling member connector 405 may comprise a profile that is arranged to be complementary to, interact with and/or cooperate with the inlet conduit 302, e.g., an internal profile of the inlet conduit 302. For example, at least a portion of the second end, e.g., its outer surface, may be threaded or comprise at least one rib. The threaded portion or at least one rib of the second end of the coupling member connector 405 may be arranged to engage and/or interact with the inlet conduit 302 (e.g., internal surface of the inlet conduit 302).

[0451] In some examples, at least a portion of the coupling member connector 405, e.g., the second end of the coupling member connector 405, may be at an angle relative to a longitudinal axis of the coupling member 404 (e.g., main body 436). The angle may be between 0 and 180 degrees. For example, the angle may be between about 90 and 180 degrees (°). In one particular example, the angle may be between about 120 and 150 °. In another example the angle is between 30 to 60 degrees. The angular arrangement of the coupling member connector 405 (i.e., at least a portion of the coupling member connector 405) relative to the coupling member 404 may provide a smooth flow path for the gases flow from the inlet conduit 302. This may mitigate or avoid abrupt turns in the gas flow path, which may potentially cause disturbances to the gas flow and/or increase the amount of noise in the nasal cannula 400 due to the gas flow.

[0452] At least a portion of the main body 436 may be tapered. The main body 436 may comprise a larger cross-sectional area at the first end in comparison to the second end. In some examples, the rate of reduction in cross-sectional area may be at least substantially constant from a first point to a second point. The first point may be positioned closer to the first end. For example, the first point may be positioned at or proximate to the first end of the main body 436 and/or the second point may be positioned at or proximate to the second end of the main body 436.

[0453] In some examples, the coupling member 404 may comprise a single gas inlet that may be arranged to be coupled with the inlet conduit 302, e.g., via a coupling member connector 405. The single gas inlet may be provided at or proximate to the first end of the coupling member 404, such as the main body 436.

[0454] In some examples, as will be explained further below, the nasal cannula 400 may be a side-swapping nasal cannula. The side-swapping nasal cannula may be arranged such that the single gas inlet of the coupling member 404 may be oriented towards one of two opposite sides of the nasal cannula 400. For example, the single gas inlet of the coupling member 404 may be reconfigurable or repositionable between being (a) oriented towards a first side (e.g., left side from the perspective of the patient (P)) of the nasal cannula 400 and (b) oriented towards a second side (e.g., right side from the perspective of the patient (P)) of the nasal cannula, as in the examples shown in FIG. 4 to FIG. 8. As will be described in further detail below, these two orientations may also be referred to as a “first operational configuration” and a “second operational configuration” of the nasal cannula 400.

[0455] A side-swapping nasal cannula may provide the advantage of increasing flexibility of use. For example, the inlet conduit 302 may be directed to either side to accommodate other medical equipment, furniture, or patient preference, among other possible reasons. Further advantages may be obtained in the case of a side-swapping nasal cannula comprising an asymmetric nasal prong geometry, or a nasal cannula system comprising one or more asymmetric nasal prong modules. The smaller of the pair of nasal prongs may accommodate a medical instrument or nasogastric tube within the patient's nostril, for example. The side-swapping nasal cannula may be configured to similarly accommodate the medical instrument or nasogastric tube.

[0456] In other examples, the coupling member 404 may comprise first and second gas inlets arranged to be coupled to a pair of inlet conduits 302, e.g., via first and second coupling member connectors 405. The first and second gas inlets may be positioned/oriented towards opposite sides of the nasal cannula 400.

[0457] In some examples, the main body 436 may comprise at least one dipped region 438 (see FIG. 40 and FIG. 43, for example). The dipped region 438 may be arranged such that it provides any one of: an indentation, a concave curve, a scooped portion or a scalloped portion. Thus, the dipped region 438 may also be referred to using any one of these terms. The at least one dipped region 438 may be arranged to accommodate the septum of the patient, in use. This can provide the advantage of improving patient comfort by minimizing contact of the nasal cannula 400 with the patient's face. Additionally, or alternatively, it can provide the advantage of reducing the likelihood of injury being caused or exacerbated due to pressure. The main body 436 may comprise a first dipped region 438 (e.g., on a first longitudinal side of the main body 436) and a second dipped region 438 (e.g., on a second longitudinal side of the main body 436). The first longitudinal side (and the first dipped region 438) may be arranged opposite to the second longitudinal side (and the second dipped region 438).

[0458] The first dipped region 438 may be arranged to accommodate the septum of the patient in the first operational configuration, in use. The second dipped region 438 may be arranged to accommodate the septum of the patient in the second operational configuration, in use. In other words, by providing the first and second dipped regions 438, it is possible to provide the abovementioned advantages of the dipped region 438 regardless of the orientation of the coupling member 404. For example, this can be advantageous for the side-swapping cannula described above, as the coupling member 404 can accommodate the patient's septum when oriented towards either the first side or the second side of the nasal cannula 400.

[0459] In some examples, the coupling member 404 may comprise a first extension 437 and a second extension 437. The first extension 437 may be positioned at or proximate to the first end of the main body 436. The first extension 437 may extend away from the main body 436 (e.g., from the first end of the main body 436). The second extension 437 may be positioned at or proximate to the second end of the main body 436. The second extension 437 may extend away from the main body 436 (e.g., from the second end of the main body 436).

[0460] The coupling member 404 may comprise at least one gas outlet 451. The at least one gas outlet 451 of the coupling member 404 may be positioned on a posterior side of the coupling member 404. In some examples, such as that shown in FIG. 7, the coupling member 404 may comprise a first gas outlet 451a and a second gas outlet 451b, e.g., left and right gas outlets, respectively. The coupling member 404 including the coupling member connector 405 may be configured to redirect the gas flow from the inlet of the coupling member connector 405 to the first and second gas outlets 451a, 451b by more than 95 degrees. For that purpose, the gas inlet of the coupling member connector 405 of the coupling member 404 may be angled towards the head of a patient when the nasal cannula is fitted to the patient. In other examples, the coupling member 404 may comprise a single gas outlet 451.

[0461] The nasal cannula 400 may comprise a frame 402. The coupling member 404 may be arranged to be coupled, e.g., mechanically and/or fluidly (e.g., pneumatically) coupled, with the frame 402 (e.g., using at least one pin 412). The coupling member 404 may be arranged to receive the flow of respiratory gases for supply, e.g., to the patient, via or through the frame 402. The coupling member 404 may be arranged to couple to an anterior side of the frame 402. The coupling between the coupling member 404 and the frame 402 may be removable. Alternatively, the coupling member 404 and the frame 402 may be permanently coupled together. In some examples, the frame 402 may be more flexible or compliant than the coupling member 404. The coupling member 404 may be rigid or semi-rigid. The term "semi-rigid" refers to material that has some degree of stiffness and structure but also retains a certain amount of flexibility

or pliability. The “semi-rigid” material may be able to retain its shape but also be able to bend or flex under pressure.

[0462] As shown in FIG. 8, the frame 402 may comprise at least one inlet opening 461, e.g., for receiving the flow of respiratory gases supplied from the coupling member 404. The at least one inlet opening 461 of the frame 402 may be arranged to be coupled, such as fluidly (e.g., pneumatically) coupled, with the at least one gas outlet 451 of the coupling member 404. The at least one inlet opening 461 may be positioned on the anterior side of the frame 402.

[0463] As shown in FIG. 7, the frame 402 may comprise at least one outlet opening 414, e.g., for supplying the flow of respiratory gases to the patient (e.g., to or through nasal prong(s) as described in further detail below). The at least one outlet opening 414 may be positioned on a posterior side of the frame 402. Each of the at least one inlet opening 461 may be arranged to be fluidly, e.g., pneumatically, coupled with a respective outlet opening 414. Each of the at least one inlet opening 461 and a respective outlet opening 414 (of the at least one outlet opening 414) may form a gas flow path. Thus, the frame 402 may comprise one or more gas flow paths, each formed by a respective inlet opening 461 and outlet opening 414. In some examples, the frame 402 may comprise two or more inlet openings 461 and/or two or more outlet openings 414. The two or more inlet openings 461 and/or two or more outlet openings 414 may be arranged to form two or more separate flow paths for the flow of respiratory gases or supply the flow of respiratory gases to separate flow paths.

[0464] In some examples, such as that shown in FIG. 7, the frame 402 may comprise a first inlet opening 461a and a second inlet opening 461b, e.g., a left inlet opening and a right inlet opening, respectively. The first inlet opening 461a and the first outlet opening 414a of the frame 402 may form a first gas flow path. The second inlet opening 461b and the second outlet opening 414b of the frame 402 may form a second gas flow path. The first gas flow path and the second gas flow path of the frame 402 may be completely separated from each other.

[0465] In some examples, the frame 402 may comprise a central portion 439, an example of which is shown in FIG. 38. The frame 402 (e.g., the central portion 439) may comprise a first projection positioned at or proximate to a first end of the central portion 439. For example, the first projection may be cantilevered from the central portion 439 (e.g., from the first end of the central portion 439). The central portion 439 may comprise a second projection positioned at or proximate to a second end of the central portion 439. For example, the second projection may be cantilevered from the central portion 439 (e.g., from the second end of the central portion 439). The first end and the second end of the central portion 439 may be oppositely arranged. The first

projection and the second projection may extend outwardly and away from a center of the central portion 439. In some examples, the first projection and/or the second projection may be at least substantially rigid. For example, the position of the first and second projections in relation to the remainder of the central portion may be at least substantially fixed. In other words, the free end of the first and second projections (i.e., the end not attached to the central portion 439) may resist moving or flexing in any direction.

[0466] The frame 402 and the coupling member 404 may be operatively coupled in a first operational configuration of the nasal cannula 400. In the first operational configuration, the first inlet opening 461a of the frame 402 may be arranged to be coupled, such as mechanically and/or fluidly (e.g., pneumatically) coupled, with the first gas outlet 451a of the coupling member 404. The second inlet opening 461b of the frame 402 may be arranged to be coupled, such as mechanically and/or fluidly (e.g., pneumatically) coupled, with the second gas outlet 451b of the coupling member 404. An example of the first operational configuration is shown in FIG. 4 to FIG. 8 and FIG. 37.

[0467] The frame 402 and the coupling member 404 may be operatively coupled in a second operational configuration of the nasal cannula 400. In the second operational configuration, the first inlet opening 461a of the frame 402 may be arranged to be coupled, such as mechanically and/or fluidly (e.g., pneumatically) coupled, with the second gas outlet 451b of the coupling member 404. Further, the second inlet opening 461b of the frame 402 may be arranged to be coupled, such as mechanically and/or fluidly (e.g., pneumatically) coupled, with the first gas outlet 451a of the coupling member 404.

[0468] The second operational configuration may be or may form a mirror image of the first operational configuration. For example, the second operational configuration may be at least substantially identical to the first operational configuration, except for the coupling member 404 being oriented towards a side of the nasal cannula 400 (e.g., the first side of nasal cannula 400) that is opposite to that of the first operational configuration, (e.g., the second side of the nasal cannula 400).

[0469] In some examples, e.g., where the nasal cannula 400 is a side-swapping nasal cannula as described above, the frame 402 and the coupling member 404 may be coupled such that their arrangement with respect to each other can be reconfigured or repositioned. By providing the ability to, e.g., rotatably, reconfigure or reposition any one or both of the frame 402 and the coupling member 404, it is possible for the nasal cannula 400 (and therefore the nasal cannula assembly 150) to adopt more than one configuration. For example, the nasal cannula 400 may be able to adopt either, and

move/transition (e.g., reversibly) between, the first operational configurations and the second operational configuration. In other words, the frame 402 and the coupling member 404 may be movable e.g., rotatable, between the first operational configuration and the second operational configuration of the nasal cannula 400. This allows the nasal cannula 400 to operate a side-swapping nasal cannula, as mentioned above.

[0470] Any one or both of the frame 402 and the coupling member 404 may be arranged to rotate about a common axis 431, e.g., as shown in FIG. 7. The common axis 431 may be centrally located on any one or both of the frame 402 and the coupling member 404. The common axis 431 may be positioned at the coupling point or coupling position of the frame 402 and the coupling member 404. In some examples, a pin 412 may be provided at and/or may define the common axis 431.

[0471] The common axis 431 may be substantially normal to the face or head of the patient, when the nasal cannula is fitted to the patient. The common axis 431 may be a sagittal axis, or within a sagittal plane, of the nasal cannula, and/or of the patient when the nasal cannula is fitted to the patient. The common axis 431, the first gas outlet 451a and the second gas outlet 451b may be spaced apart from each other. For example, the first and second gas outlets 451a, 451b may be positioned on opposite sides of the common axis 431.

[0472] In some examples, the coupling member 404 may be able to rotate or swivel with respect to the frame 402 (e.g., from the first operational configuration to the second operational configuration or vice versa). The coupling member 404 may be arranged to rotate about the pin 412 and/or the common axis 431.

[0473] Additionally or alternatively, the frame 402 may be able to rotate or swivel with respect to the coupling member 404 (e.g., from the first operational configuration to the second operational configuration or vice versa). The frame 402 may be arranged to rotate about the pin 412 and/or the common axis 431.

[0474] In some examples, any one or both of the frame 402 and the coupling member 404 may be arranged to pivot or rotate at least approximately 180° (or approximately 180°) with respect to each other, e.g., between the first operational configuration and the second operational configuration.

[0475] The movement (e.g., rotational movement) of any one or both of the frame 402 and the coupling member 404 may be reversible. For example, the coupling member 404 may be arranged to move (e.g., rotate or swivel) with respect to the frame 402 in a first direction and also in a second direction. The first direction (e.g., clockwise direction) may be opposite to the second direction (e.g., anti-clockwise direction).

[0476] Additionally or alternatively, the frame 402 may be arranged to move (e.g., rotate or swivel) with respect to the coupling member 404 in the first direction and also the second direction.

[0477] In some examples, to move the nasal cannula 400 into or out of the first operational configuration and/or the second operational configuration, the position of the frame 402 and the coupling member 404 relative to each other may need to be altered. To achieve this, a force (e.g., a turning or rotational force) may be required to be applied to any one or both of the frame 402 and the coupling member 404. For example, this may be achieved in any one or more of the following ways:

- with the position of the frame 402 remaining fixed, a force can be applied to the coupling member 404 to move the nasal cannula 400 into or out of the first and/or second operational configurations;
- with the position of the coupling member 404 remaining fixed, a force can be applied to the frame 402 to move the nasal cannula 400 into or out of the first and/or second operational configurations; and
- a first force can be applied to the frame 402 and a second force can be applied to the coupling member 404, where the direction of the first force may be opposite to the direction of the second force.

[0478] In some examples, the frame 402 and the coupling member 404 may be arranged to move between the first operational configuration and the second operational configuration whilst the nasal cannula 400 is donned by the patient.

[0479] In some examples, the nasal cannula 400 may comprise a retention mechanism. The retention mechanism may be arranged to removably or reversibly retain the frame 402 and the coupling member 404 in any one of the first operational configuration and the second operational configuration.

[0480] When the nasal cannula 400 (e.g., the frame 402 and the coupling member 404) moves into and/or out of the first operational configuration and/or the second operational configuration, the retention mechanism may provide any one or more of: visual feedback, audio feedback and tactile feedback.

[0481] In some examples, as shown in FIG. 37 and FIG. 38 by way of example, the frame 402 may comprise one or more securing members 432. For example, the frame 402 may comprise a first securing member 432 and a second securing member 432. Each of the one or more securing members 432 may comprise a post.

[0482] In some examples, as shown in FIG. 37 and FIG. 39 to FIG. 43 by way of example, the coupling member 404 may comprise one or more receiving portions 433. For example, the coupling member 404 may comprise a first receiving portion 433 and a second receiving portion 433. Each of the one or more receiving portions 433 may comprise two protrusions defining a receiving recess therebetween. Each receiving recess may be arranged to receive at least a portion of a respective securing member 432 (e.g., the post of each securing member 432). The receiving recess may comprise a curved configuration. The curved configuration of each receiving recess may be arranged to cooperate with or correspond to a curved configuration of a corresponding portion (e.g., post) of the one or more securing members 432. In some examples, the one or more receiving portions 433 may be spaced from gas outlet(S) 451 of the coupling member 404. At least a portion of the frame 402 may be arranged to be positioned in the space between the one or more receiving portions 433 and the gas outlet(s) 451 of the coupling member 404.

[0483] In some examples, the one or more securing members 432 may be arranged to be reversibly or removably coupled to the one or more receiving portions 433 in any one of the first operational configuration and the second operational configuration. The one or more securing members 432 may be arranged to be coupled to, and decoupled from, the one or more receiving portions 433 in a bi-directional manner. In some examples, when the nasal cannula 400 (e.g., the frame 402 and the coupling member 404) is in the first operational configuration or the second operational configuration, the one or more securing members 432 and the one or more receiving portions 433 may be arranged to be decoupled when urged by a force above a first threshold; and remain coupled in the absence of a force that is above the first threshold. In some examples, when the nasal cannula 400 is in the first operational configuration or the second operational configuration, the one or more securing members 432 and the one or more receiving portions 433 may be arranged to be coupled when urged by a force above a second threshold and remain decoupled in the absence of force that is above the second threshold. The first and second thresholds may be at least substantially the same. As mentioned above, the force may be rotational.

[0484] In some examples, in the first operational configuration, the first securing member 432 may be arranged to be coupled with the first receiving portion 433 and the second securing member 432 may be arranged to be coupled with the second receiving portion 433. In the second operational configuration, the first securing member 432 may be arranged to be coupled with the second receiving portion 433 and the second securing member 432 may be arranged to be coupled with the first receiving portion 433.

[0485] The retention mechanism may comprise the one or more securing members 432 and the one or more receiving portions 433. In other words, the one or more securing members 432 and the one or more receiving portions 433 may form at least a portion of the retention mechanism.

[0486] In some examples, the nasal cannula 400 may comprise a fastening mechanism. The fastening mechanism may be arranged to limit or prohibit flexion or deformation of the frame 402 (which, as explained above, may be flexible or compliant than the coupling member 404) in any one of the first operational configuration and the second operational configuration.

[0487] In some examples, as shown in FIG. 38 and FIG. 45 by way of example, the frame 402 may comprise one or more blocking portions 434. The one or more blocking portions 434 may comprise a first blocking portion 434 and a second blocking portion 434. The one or more blocking portions 434 may comprise a surface that is at least substantially planar.

[0488] In some examples, as shown in FIG. 41 and FIG. 44 by way of example, the coupling member 404 may comprise one or more barrier portions 435. The one or more barrier portions 435 may comprise a first barrier portion 435 and a second barrier portion 435. The one or more barrier portions 435 may comprise a raised portion.

[0489] In some examples, the one or more blocking portions 434 (e.g., the at least substantially planar surface) may be arranged to abut or press against or engage the one or more barrier portions 435 (e.g., the raised portion), e.g., in any one of the first operational configuration and the second operational configuration. In some examples, in the first operational configuration, the first blocking portion 434 may be arranged to engage or abut or press against the first barrier portion 435 and second blocking portion 434 may be arranged to engage or abut or press against the second barrier portion 435. In some examples, in the second operational configuration, the first blocking portion 434 may be arranged to engage or abut or press against the second barrier portion 435 and second blocking portion 434 may be arranged to engage or abut or press against the first barrier portion 435.

[0490] The fastening mechanism may comprise the one or more blocking portions 434 and the one or more barrier portions 435. In other words, the one or more blocking portions 434 and the one or more barrier portions 435 may form at least a portion of the fastening mechanism.

[0491] In some examples, the first extension 437 may comprise the first receiving portion 433 and/or the second extension 437 may comprise the second receiving portion 433. The first receiving portion 433 and/or the second receiving portion 433 may extend

towards the main body 436, e.g., from a distal end of the first extension 437 and the second extension 437, respectively. In some examples, the first extension 437 may comprise the first barrier portion 435 and/or the second extension 437 may comprise the second barrier portion 435. In some examples, the first projection of the frame 402 may comprise the first blocking portion 434 and the second projection may comprise the second blocking portion 434.

[0492] In some examples, the frame 402 may comprise one or more first sealing members. The coupling member 404 may comprise one or more second sealing members. The one or more first sealing members and the one or more second sealing members may be arranged to mate or cooperate with each other in any one of the first operational configuration and the second operational configuration, e.g., to provide a gas flow path between the frame 402 and the coupling member 404 that is at least substantially sealed from the ambient air.

[0493] In some examples, the one or more first sealing members and the one or more second sealing members may be arranged to provide a groove and tongue sealing arrangement. For example, the one or more first sealing members may comprise a first tongue 423 and a second tongue 423, as shown in FIG. 45 for example. The first tongue 423 may be provided around or proximate to the first inlet opening 461a of the frame 402 and the second tongue 423 may be provided around or proximate to the second inlet opening 461b of the frame 402. The one or more second sealing members comprise a first groove 424 and a second groove 424, as shown in FIG. 44 for example. The first groove 424 may be provided around or proximate to the first gas outlet 451a of the coupling member 404 and the second groove 424 may be provided around or proximate to the second gas outlet 451b of the coupling member 404.

[0494] In some examples, in the first operational configuration, the first groove 424 may be arranged to receive and/or at least substantially seal against the first tongue 423 and the second groove 424 may be arranged to receive and/or at least substantially seal against the second tongue 423. In the second operational configuration, the first groove 424 may be arranged to receive and/or at least substantially seal against the second tongue 423 and the second groove 424 may be arranged to receive and/or at least substantially seal against the first tongue 423.

[0495] In some examples, the nasal cannula 400 may comprise one or more conduit fasteners 446. Each conduit fastener 446 may be arranged to prohibit or reduce the likelihood of a respective inlet conduit 302 from decoupling from the nasal cannula, e.g., by reinforcing or further securing the attachment/coupling of the respective inlet conduit 302 to the nasal cannula 400. In some examples, each of the at least one inlet conduit 302 may be susceptible to swelling/expanding and/or contracting due to several

reasons, such as thermal changes or absorption of moisture/fluid by the conduit. Therefore, by providing the conduit fastener(s) 446 to reinforce or further secure the attachment of the inlet conduit 302 to the nasal cannula 400, it is possible to avoid the undesirable effect of the inlet conduit 302 unintentionally decoupling from the nasal cannula 400 (e.g., due to the expansion or swelling of the inlet conduit 302). This ensures that therapy being provided to the patient can remain uninterrupted regardless of the conditions that the at least one inlet conduit 302 is exposed to. In some examples, the one or more conduit fasteners 446 may each comprise at least one tab. Each of the at least one tab may extend towards the respective inlet conduit 302, in use.

[0496] Possible examples of the conduit fastener(s) 446 are shown in FIG. 41 to FIG. 43. In some examples, e.g., as shown in FIG. 41, the coupling member 404 (arranged to be directly or indirectly coupled to the at least one inlet conduit 302) may comprise the one or more conduit fasteners 446. For example, any one or both of the first extension 437 and the second extension 437 may comprise the one or more conduit fastener 446. For instance, the first extension 437 may comprise a conduit fastener 446.

[0497] In some examples, e.g., as shown in FIG. 42 and FIG. 43, each of the one or more coupling member connectors 405 (which may be arranged to couple the coupling member 404 to a respective inlet conduit 302) may comprise a respective conduit fastener 446.

[0498] In some examples, the headgear 306 may be at least partially flexible. At least a portion of the headgear 306 may be stretchable. For example, at least a portion of the headgear 306 may be elastic. The flexibility of at least a portion of the headgear 306 may allow the frame 402 and the coupling member 404 to be at least partially separated from the patient's face, whilst the nasal cannula 400 is donned by the patient. In such an arrangement, it may be possible to move the nasal cannula 400 between the first operation configuration and the second operational configuration, whilst the nasal cannula 400 is donned by the patient. For example, it may be possible to rotate the coupling member 404 with respect to the frame 402 to move between the first operational configuration and the second operational configuration.

[0499] The frame 402 may comprise one or more side arms 407. In some examples, the frame 402 may comprise a first side arm 407a and a second side arm 407b. The first side arm 407a and the second side arm 407b may be attached to the central portion 439.

[0500] As shown in the example of FIG. 7, the first side arm 407a may be attached to a first end of the central portion 439 via a first connecting region 4071a and the second side arm 407b may be attached to a second end of the central portion 439 via a second

connecting region 4071b. The first connecting region 4071a may comprise a smaller thickness and/or width in comparison to the central portion 439 and the first side arm 407a. The second connecting region 4071b may comprise a smaller thickness and/or width in comparison to the central portion 439 and the second side arm 407b.

[0501] In some examples, the first connecting region 4071a and/or the second connecting region 4071b may be arranged to flex or pivot in multiple directions. The frame 402 may comprise a first pivoting or flexing axis 4072a and/or a second pivoting or flexing axis 4072b. The first pivoting or flexing axis 4072a may be positioned at or proximate to the first connecting region 4071a. The second pivoting or flexing axis 4072b may be positioned at or proximate to the second connecting region 4071b. The first pivoting or flexing axis 4072a and the second pivoting or flexing axis 4072b may be positioned along a posterior surface of the nasal cannula 400 (e.g., the frame 402), in use.

[0502] The first side arm 407a may be arranged to flex or pivot about the first pivoting or flexing axis 4072a. The second side arm 407b may be arranged to flex or pivot about the second pivoting or flexing axis 4072b. The first side arm 407a and/or the second side arm 407b may be able to flex or pivot in a first direction, e.g., towards a posterior surface of the central portion 439 of the frame 402, and a second direction that is opposite to the first direction, e.g., away from the posterior surface of the central portion 439 of the frame 402.

[0503] In some examples, the first connecting region 4071a and/or the second connecting region 4071b may be arranged to be more flexible than the central portion 439, the first side arm 407a and/or the second side arm 407b.

[0504] In some examples, the first side arm 407a may comprise a first overmolded portion and the second side arm 407b may comprise a second overmolded portion. The first and second overmolded portions may be made of material that is softer than that of the central portion 439 and/or the first connecting region 4071a and second connecting region 4071b.

[0505] The one or more side arms 407 may be arranged to engage one or more of the oral region (e.g., the nasolabial sulci), the buccal region, and/or the zygomatic region of the patient's head when properly fitted to the patient. The one or more side arms 407 may transfer at least some of the headgear tension forces to lateral regions. Alternatively or additionally, the one or more side arm 407 may transfer at least some of the headgear tension forces away from one or more of the philtrum of the oral region and the nasal region (e.g., columella and/or alar), which may be more sensitive or prone to irritation and/or discomfort.

[0506] The frame 402 may be arranged to, e.g., in combination with the headgear 306, secure the nasal cannula 400 in position on the head of the patient. The headgear 306 may be arranged to be removably and/or adjustably coupled with the frame 402. Each of the one or more side arms 407 may comprise one or more headgear connecting portion 409. For example, the first side arm 407a may comprise a first headgear connecting portion 409a and the second side arm 407b may comprise a second headgear connecting portion 409b.

[0507] The headgear 306 may comprise at least one end on each side of the patient's head, e.g., the first and second side strap portions attached to the central strap portion, that may be arranged to be, e.g., removably and/or adjustably, coupled with the first headgear connecting portion 409a and the second headgear connecting portion 409b, respectively.

[0508] As mentioned above, the one or more headgear connecting portions 409 may each be arranged to, e.g., removably and adjustably, receive and retain a portion of the headgear 306, e.g., the first and second side strap portions of the headgear 306. In some examples, the first headgear connecting portion 409a and second headgear connecting portion 409b may each comprise at least two openings (e.g., two openings). The at least two openings may be separated, e.g., by at least one dividing portion (e.g., one dividing portion). In some examples, a portion of the headgear 306, e.g., the first and second side strap portions of the headgear 306, may be arranged to pass through the at least two openings and loop around the at least one dividing portion. The direction in which the portion of the headgear 306 passes through one of the at least two openings may be opposite to that of another of the at least two openings. This may allow the portion of the headgear 306 to be securably received and retained by the headgear connecting portion, e.g., by facilitating a frictional engagement of the portion of the headgear 306 with the respective headgear connecting portion 409 of the nasal cannula 304.

[0509] Additionally or alternatively, the headgear 306 may comprise a fastening mechanism. The fastening mechanism may be utilized to prevent any portion of the headgear 306 (e.g., the first and second side strap portions) becoming loose/untethered. The fastening mechanism may be arranged to allow the headgear 306 to attach on to itself, e.g., at or near its free end(s). The fastening mechanism may comprise a hook and loop arrangement, e.g., Velcro®.

[0510] In some examples, the length of headgear 306 may be selectively adjusted by selecting the portion(s) of the headgear 306, e.g., of the first and second side strap portion, for coupling with the first headgear connecting portion 409a and second headgear connecting portion 409b.

[0511] In some examples, any one or both of the first headgear connecting portion 409a and the second headgear connecting portion 409b may comprise a single opening. In some examples, any one or both of the first headgear connecting portion 409a and the second headgear connecting portion 409b may comprise more than two openings.

[0512] As will be further described below, the frame 402 may comprise one or more mounting portions 411 for removably receiving a respective tubing clip 410. The tubing clip 410 may be arranged to retain the at least one inlet conduit 302. In some examples, the first side arm 407a may comprise one or more first mounting portions 411a and/or the second side arm 407b may comprise one or more second mounting portions 411b. In some examples, the one or more mounting portion 411, e.g., any one or both of the first mounting portion 411a and the second mounting portion 411b, may comprise at least one recess or opening.

Tubing Clip

[0513] The nasal cannula 400 may comprise at least one tubing clip 410. Each of the at least one tubing clip 410 may be arranged to retain a respective inlet conduit 302. Each of the at least one tubing clip 410 may comprise a body 4111 and an attachment portion 4112 coupled to the body. Examples of the tubing clip 410 is shown in FIG. 46 and FIG. 47.

[0514] Each of the at least one tubing clip 410 may comprise a body 4111 for receiving a respective inlet conduit 302. The body of the tubing clip 410 may be at least substantially annular (as shown in the figures), square, substantially square or of another rectilinear configuration, for example (not shown). The tubing clip 410 may comprise an attachment portion 4112 that may be integral with or fixed to its body. The attachment portion may be non-moveably, pivotably, rotatably and/or removably fixed to the body. In some examples, the attachment portion 4112 of the tubing clip 410 may be received by the at least one recess or opening of the one or more mounting portions 411. The tubing clip 410 (e.g., the attachment portion) may be arranged to be removably coupled or fastened (e.g., via a snap fit or snap engage mechanism) to the frame 402, e.g., to the first side arm 407a or the second side arm 407b. For example, the attachment portion (and therefore the tubing clip 410) may be arranged to be removably coupled or fastened one or more mounting portion 411 of the frame 402, and removably retain the tubing clip 410 securely in place. The tubing clip 410 (e.g., the attachment portion) may be arranged to couple to the frame 402 (e.g., the first side arm 407a or second side arm 407b) in one or more coupling orientations.

[0515] In some examples, the body 4111 of the tubing clip 410 may comprise one or more gripping features, e.g., on its outer surface. In some examples, the inner diameter

of the body 4111 of the tubing clip 410 may be larger than an outer diameter of the respective inlet conduit 302.

[0516] In some examples, the attachment portion 4112 may comprise a securing portion 4113 and one or more alignment portions 4114. The securing portion 4113 may be centrally positioned on the attachment portion 4112. The securing portion 4113 may be arranged to removably coupled to an aperture of the first side arm 407a or the second side arm 407b (e.g., the first mounting portion 411a or the second mounting portion 411b). The one or more alignment portions 4114 may be arranged to prohibit the coupling of the securing portion 4113 to the aperture of the first side arm 407a or second side arm 407b, e.g., when the attachment portion 4112 is not in the one or more coupling orientations.

[0517] This arrangement allows attachment of a tubing clip 410 to any one or both of the one or more first mounting portion 411a and one or more second mounting portions 411b. This can allow for a single inlet conduit 302 or any one or both of a pair of inlet conduits 302 to be removably attachable to the nasal cannula 400, e.g., by coupling with gas inlet(s) of any one or both of the coupling member 404 and the frame 402.

[0518] In examples where the nasal cannula 400 may comprise a single inlet conduit 302, a single tubing clip 410 may be provided to retain the single inlet conduit 302. The single tubing clip 410 may be removably attachable to either the first mounting portion 411a or the second mounting portion 411b.

[0519] In examples where the nasal cannula 400 comprises a pair of inlet conduits 302 (e.g., a first inlet conduit and a second inlet conduit), one of the pair of inlet conduits 302 (e.g., the first inlet conduit) may be coupled to the coupling member 404 via a first coupling member connector and the other of the pair of inlet conduits 302 (e.g., the second inlet conduit) may be coupled to the coupling member 404 via a second coupling member connector.

[0520] In examples where the nasal cannula 400 comprises a pair of inlet conduits 302 (e.g., a first inlet conduit and a second inlet conduit), one of the pair of inlet conduits 302 (e.g., the first inlet conduit) may be removably attachable to the first side arm 407a and retained by a first clip and the other of the pair of inlet conduits 302 may be removably attachable to the second side arm 407b and retained by a second clip.

[0521] The at least one tubing clip 410 may be attached to the frame 402 such that the attachment mechanism prevents, or reduces the likelihood of, undesirable detachment of the at least one tubing clip 410 (and therefore the at least one inlet conduit 302) from the frame 402. In some examples, the forces may be external. In

some examples, the forces may comprise a bending moment, e.g., being applied to the at least one inlet conduit 302.

Prongs

[0522] The nasal cannula 400 may comprise at least one nasal prong. Each of the at least one nasal prong may be arranged to extend into a naris, e.g., a nostril, of the patient and deliver the flow of respiratory gases to the patient, e.g., to the upper airway of the patient. The at least one nasal prong may comprise any one or both of a first nasal prong and a second nasal prong. The first nasal prong may be arranged to extend into a left nostril of the patient to form a left nasal prong. The second nasal prong may be arranged to extend into a right nostril of the patient to form a right nasal prong. Examples of the at least one nasal prong described in further detail below comprise but are not limited to: at least one nasal prong 406 (shown in FIG. 4 to FIG. 22), at least one nasal prong 506 (shown in FIG. 23 to FIG. 25), at least one nasal prong 606 (shown in FIG. 26 to FIG. 28, and at least one nasal prong 706 (shown in FIG. 29 to FIG. 31).

[0523] The at least one nasal prong may be arranged to be (directly or indirectly) pneumatically coupled with the at least one outlet opening 414 of the frame 402 to receive the flow of respiratory gases from the frame 402. In some examples, the first nasal prong may be arranged to be (directly or indirectly) fluidly, e.g., pneumatically, coupled with the first outlet opening 414a and the second nasal prong may be arranged to be (directly or indirectly) pneumatically coupled with the second outlet opening 414b. For example, as shown in FIG. 7 and FIG. 8, a first nasal prong 406a may be arranged to be (directly or indirectly) pneumatically coupled with the first outlet opening 414a and a second nasal prong 406b may be arranged to be (directly or indirectly) pneumatically coupled with the second outlet opening 414b. This arrangement may also apply to other examples of the first and second nasal prongs, such as first nasal prongs 506a, 606a, 706a, and second nasal prongs 506b, 606b, 706b, which will be discussed in further detail below.

[0524] In some examples, the at least one nasal prong 406 may be arranged to only partially occlude at least one of the left nostril and the right nostril of the patient. For example, the first nasal prong 406a may be arranged to only partially occlude the left nostril of the patient and the second nasal prong 406b may be arranged to only partially occlude the right nostril of the patient.

[0525] In further examples of the present disclosure, the nasal cannula 400 may comprise only a left nasal prong or only a right nasal prong.

Prong Geometry

[0526] In the context of the present disclosure, the configuration of the at least one nasal prong will be referred to as the “nasal prong geometry”. Configuration or geometry of the at least one nasal prong may refer to any one or more aspects of the at least one nasal prong, comprising but not limited to, prong size, angular configuration, prong thickness, prong rigidity, prong dimensions such as length, internal and/or external diameter (e.g., transverse diameter), cross-sectional area, perimeter, prong shape and the like. In some examples, the type or variant of the therapy being provided to the patient by the respiratory support system is at least in part dependent on or determined by the nasal prong geometry of the nasal cannula assembly 150 of the respiratory support system.

[0527] A portion of possible nasal prong geometries may be categorized as “symmetric nasal prong geometries” and another portion of possible nasal prong geometries may be categorized as “asymmetric nasal prong geometries”.

[0528] A symmetric nasal prong geometry may be arranged to provide a symmetric nasal high flow therapy to the patient.

[0529] In a symmetric nasal prong geometry, the first nasal prong and the second nasal prong may be arranged to provide substantially the same volumetric flow rate. The first nasal prong and the second nasal prong may be substantially similar or identical in one or more of the following aspects: size, thickness, rigidity, dimensions such as length internal and/or external diameter (e.g., transverse diameter), cross-sectional area, perimeter, shape and the like.

[0530] In some examples of symmetric nasal prong geometries, the orientation and/or angular configuration of the left nasal prong and right nasal prong may not be identical (or substantially similar) to each other. Instead, in these examples, the first nasal prong may form or be in at least substantially a “mirror-image” of the second nasal prong. In other words, the first nasal prong and second nasal prong may be symmetrical about or with reference to a reference point, axis or plane (e.g., a sagittal plane S as shown in FIG. 16). The sagittal plane S may be a vertical plane which passes through (or proximate to) a center-point or mid-point, e.g., between the first nasal prong and the second nasal prong.

[0531] In some examples, the first nasal prong and the second nasal prong may comprise the same, or substantially the same, orientation with reference to the sagittal plane S. For example, the first nasal prong may be angled towards the sagittal plane S on one side of the sagittal plane S and the second nasal prong may be angled towards the sagittal plane S on the other side of the sagittal plane S, where the angles of the

first nasal prong and the second nasal prong are at least substantially the same. In other words, the first nasal prong and the second nasal prong may both be positioned at least approximately at the same angle towards each other. In another example, the first nasal prong and second nasal prong may both be positioned at least approximately at the same angle away from the sagittal plane S (and therefore angled outward and away from each other) or positioned at least approximately at right angles with respect to the sagittal plane S.

[0532] Possible examples of symmetric nasal prong geometries according to the present disclosure have been described in detail below, with some possible examples provided with reference to the figures.

[0533] With reference to FIG. 4 to FIG. 22, the at least one nasal prong 406 may comprise any one or both of a first nasal prong 406a and a second nasal prong 406b. In some examples, the first nasal prong 406a and the second nasal prong 406b together may comprise, be arranged in or form a symmetric nasal prong geometry. As mentioned above, in the symmetric nasal prong geometry, the first nasal prong 406a and the second nasal prong 406b may be identical (or substantially similar) , e.g., in one or more of the following: size, thickness, rigidity, dimensions such as length, internal and/or external diameter (e.g., transverse diameter), cross-sectional area, perimeter, shape and the like.

[0534] The first nasal prong 406a and the second nasal prong 406b may both be positioned at least approximately at the same angle towards the sagittal plane S (and therefore angled inwards towards each other). Alternatively, the first nasal prong 406a and second nasal prong 406b may both be positioned at least approximately at the same angle away from the sagittal plane S (and therefore angled outward and away from each other) or positioned at least approximately at right angles with respect to the sagittal plane S.

[0535] According to the present disclosure, it is possible for one example of a symmetric nasal prong geometry to differ from other example(s) of a symmetric nasal prong geometry(s) in any one or more aspects. In some examples, the first nasal prong and the second nasal prong of a first symmetric nasal prong geometry may be different in one or more aspects in comparison to the first nasal prong and the second nasal prong of a second symmetric nasal prong geometry. These aspects comprise but are not limited to: nasal prong size, angular configuration of nasal prongs, thickness and/or rigidity of material of the nasal prongs, dimension of nasal prongs such as length, internal and/or external diameter (e.g., transverse diameter), cross-sectional area, perimeter and shape of nasal prongs.

[0536] In another example of the present disclosure, FIG. 23 to FIG. 25 shows a first nasal prong 506a and a second nasal prong 506b. The first nasal prong 506a may be arranged to extend into a left nostril of the patient to form a left nasal prong. The second nasal prong 506b may be arranged to extend into a right nostril of the patient to form a right nasal prong. The first nasal prong 506a and the second nasal prong 506b may comprise, be arranged in or form a symmetric nasal prong geometry. The first nasal prong 506a and the second nasal prong 506b may be identical (or substantially similar), e.g., in one or more of the following: size, thickness, rigidity, dimensions such as length, internal and/or external diameter (e.g., transverse diameter), cross-sectional area, perimeter, shape and the like.

[0537] The first nasal prong 506a and the second nasal prong 506b may both be positioned at least approximately at the same angle towards the sagittal plane S (and therefore angled inwards towards each other). Alternatively, the first nasal prong 506a and second nasal prong 506b may both be positioned at least approximately at the same angle away from the sagittal plane S (and therefore angled outward and away from each other) or positioned at least approximately at right angles with respect to the sagittal plane S.

[0538] The first nasal prong 406a and the second nasal prong 406b of the example of FIG. 9 to FIG. 22 may comprise, be arranged in or form a first symmetric nasal prong geometry and the first nasal prong 506a and the second nasal prong 506b of the example of FIG. 23 to FIG. 25 may comprise, be arranged in or form a second symmetric nasal prong geometry. The first nasal prong 406a and the second nasal prong 406b may be provided in a first size and the first nasal prong 506a and the second nasal prong 506b may be provided in a second size. The first size may be different to (e.g., bigger or smaller than) the first size.

[0539] In some examples, the internal transverse dimension or cross-sectional area (i.e., transverse dimension or cross-sectional area of an inner surface) of the first nasal prong 406a and second nasal prong 406b may be smaller than the internal transverse dimension or cross-sectional area of the first nasal prong 506a and the second nasal prong 506b, respectively. Additionally, or alternatively, the external diameter (e.g., transverse diameter) or cross-sectional area or perimeter (i.e., diameter or cross-sectional area or perimeter of an outer surface) of the first nasal prong 406a and second nasal prong 406b may be smaller than the external diameter (e.g., transverse diameter) or cross-sectional area or perimeter of the first nasal prong 506a and the second nasal prong 506b, respectively.

[0540] Alternatively or in addition to the prongs having different sizes, the left nasal prong and right nasal prong of a first symmetric nasal prong geometry may be positioned

at an angle with reference to the sagittal plane S at a first angle (e.g., an angle towards the sagittal plane S) and the left nasal prong and right nasal prong of a second symmetric nasal prong geometry may be positioned at an angle with reference to the sagittal plane S at a second angle (e.g., an angle away from the sagittal plane S), which is different to the first angle.

[0541] In an “asymmetric nasal prong geometry”, there may only be provided one nasal prong (i.e., only the first nasal prong or the second nasal prong) or two nasal prongs (i.e., both of the first nasal prong and the second nasal prong), which may be different from each other in one or more aspects. These aspects may comprise but are not limited to: prong size, angular configuration of nasal prongs, thickness and/or rigidity of material of the nasal prongs, dimension of nasal prongs such as length, internal and/or external diameter (e.g., transverse diameter), cross-sectional area, perimeter or perimeter and shape of nasal prongs.

[0542] In some examples of the asymmetric nasal prong geometry, the first nasal prong and the second nasal prong may be arranged such that:

- an internal diameter (e.g., transverse diameter) or cross-sectional area or perimeter of the first nasal prong may be different to a corresponding internal diameter (e.g., transverse diameter) or perimeter of the second nasal prong; and/or
- an external diameter (e.g., transverse diameter) or cross-sectional area or perimeter of the first nasal prong may be different to a corresponding external diameter (e.g., transverse diameter) or cross-sectional area or perimeter of the second nasal prong.

[0543] The asymmetric nasal prong geometry may be arranged to provide asymmetric nasal high flow therapy to the patient. Amongst other benefits, asymmetric nasal high flow therapy may provide the advantage of increasing CO₂ clearance, increased pressure and/or reduced work of breathing, e.g., in comparison to symmetric nasal high flow therapy. Dead space clearance may be increased by creating an at least partially unidirectional flow to purge expired gas. Asymmetric nasal high flow therapy may achieve the effect of at least partially unidirectional flow primarily due to its ability to create relative occlusion of the patient’s two nares using only one prong or two prongs that are different from each other.

[0544] Possible examples of asymmetric nasal prong geometries according to the present disclosure have been described in detail below, with some possible examples provided with reference to the figures.

[0545] As mentioned above, in some examples, the nasal cannula 400 may comprise the at least one nasal prong 606. With reference to FIG. 26 to FIG. 28, the at least one nasal prong 606 may comprise any one or both of a first nasal prong 606a and a second nasal prong 606b. The first nasal prong 606a may be arranged to extend into a left nostril of the patient to form a left nasal prong. The second nasal prong 606b may be arranged to extend into a right nostril of the patient to form a right nasal prong. In some examples, the first nasal prong 606a and second nasal prong 606b may comprise, be arranged in or form an asymmetric nasal prong geometry. For example, the first nasal prong 606a and second nasal prong 606b may comprise, be arranged in or form a “right asymmetric nasal prong geometry”, where the first nasal prong 606a and second nasal prong 606b may be arranged such that:

- an internal diameter (e.g., transverse diameter) or cross-sectional area or perimeter of the second nasal prong 606b is or may be greater than a corresponding internal diameter (e.g., transverse diameter) or cross-sectional area or perimeter of the first nasal prong 606a; and/or
- an external diameter (e.g., transverse diameter) or cross-sectional area or perimeter of the second nasal prong 606b is or may be greater than a corresponding external diameter (e.g., transverse diameter) or cross-sectional area or perimeter of the first nasal prong 606a.

[0546] In some examples, in a right asymmetric nasal prong geometry, one of two nasal prongs (e.g., the second nasal prong 606b) may be arranged to provide a greater volumetric flow rate than the other of the two nasal prongs (e.g., the first nasal prong 606a).

[0547] As mentioned above, in some examples, the nasal cannula 400 may comprise the at least one nasal prong 706. With reference to the example of FIG. 29 to FIG. 31, the at least one nasal prong 706 may comprise any one or both of a first nasal prong 706a and a second nasal prong 707b. The first nasal prong 706a may be arranged to extend into a left nostril of the patient to form a left nasal prong. The second nasal prong 707b may be arranged to extend into a right nostril of the patient to form a right nasal prong. In some examples, the first nasal prong 706a and second nasal prong 707b may comprise, be arranged in or form an asymmetric nasal prong geometry. For example, the first nasal prong 706a and second nasal prong 707b may comprise, be arranged in or form a “left asymmetric nasal prong geometry”, where the first nasal prong 706a and second nasal prong 707b may be arranged such that:

- the internal diameter (e.g., transverse diameter) or cross-sectional area or perimeter of the first nasal prong 706a is greater than a corresponding internal

diameter (e.g., transverse diameter) or cross-sectional area or perimeter of the second nasal prong 707b; and/or

- the external diameter (e.g., transverse diameter) or cross-sectional area or perimeter of the first nasal prong 706a is greater than a corresponding external diameter (e.g., transverse diameter) or cross-sectional area or perimeter of the second nasal prong 707b.

[0548] In some examples, in a left asymmetric nasal prong geometry, one of two nasal prongs (e.g., the first nasal prong 706a) may be arranged to provide a greater volumetric flow rate than the other of the two nasal prongs (e.g., the second nasal prong 706b)

[0549] In some examples, a first nasal prong geometry (e.g., a first asymmetric nasal prong geometry) may comprise, be arranged in or form a mirror-image of a second nasal prong geometry (e.g., a second asymmetric nasal prong geometry). For example, the features of the first nasal prong geometry may be inversely arranged in comparison with the second nasal prong geometry.

[0550] In some examples, the left asymmetric nasal prong geometry may comprise, be arranged in, or form a mirror-image of the right asymmetric nasal prong geometry. For example, the nasal prong geometry of the first nasal prong 606a and the second nasal prong 606b (e.g., left asymmetric nasal prong geometry), may comprise, be arranged in or form a mirror-image of the nasal prong geometry of the first nasal prong 706a and second nasal prong 707b (e.g., right asymmetric nasal prong geometry) may comprise, be arranged in or form a mirror-image of the second asymmetric nasal prong geometry.

[0551] The nasal cannula 400 may be arranged to comprise any one of a range of nasal prong geometries, such as any one of the examples of nasal prong geometries discussed above. With reference to FIG. 4 to FIG. 8, the nasal cannula 400 may comprise the nasal prong geometry of the at least one nasal prong 406 (e.g., first nasal prong 406a and second nasal prong 406b shown in FIG. 9 to FIG. 22). Alternatively, the nasal cannula 400 may be arranged to comprise the nasal prong geometries of any one of:

- at least one nasal prong 506 (e.g., first nasal prong 506a and second nasal prong 506b shown in FIG. 23 to FIG. 25),
- at least one nasal prong 606 (e.g., first nasal prong 606a and second nasal prong 606b shown in FIG. 26 to FIG. 28),

- at least one nasal prong 706 (e.g., first nasal prong 706a and second nasal prong 707b shown in FIG. 29 to FIG. 31).

[0552] In some examples, at least a portion (e.g., a distal portion) of each of the at least one nasal prong (e.g., at least one nasal prong 406, 506, 606, 706) may be arranged such that it may project upwardly and posteriorly, in use (e.g., in relation to the patient's face). In some examples, at least a portion (e.g., a distal portion) of the at least one nasal prong (e.g., at least one nasal prong 406, 506, 606, 706) may be angled away from a coronal plane C (e.g., the coronal plane C shown in FIG. 13), and e.g., may be angled towards the patient when the nasal cannula has been donned by the patient. In some examples, the angle between the at least one nasal prong and the coronal plane C may be an acute angle. In the context of the present disclosure, the coronal plane C may be a vertical plane that may divide the nasal cannula (or any of its parts) into anterior and posterior portions.

Nasal Prong Module

[0553] According to the present disclosure, the nasal cannula 400 may be arranged to operate as a “modular nasal cannula”. That is, a portion of the nasal cannula 400 (which may comprise one or more components or elements of the nasal cannula 400) may be arranged to be selectively and/or removably coupled to the remaining portion of the nasal cannula 400. The coupling between the portion of the nasal cannula 400 to the remaining portion of the nasal cannula 400 may comprise any one or more of: mechanical, fluid (e.g., pneumatic), and electrical.

[0554] In some examples, the module nasal cannula may be arranged such that a nasal prong module may comprise the at least one nasal prong of the nasal cannula 400. The nasal prong module may be arranged to be selectively and/or removably coupled, for example, mechanically and/or fluidly (e.g., pneumatically), to a portion of the nasal cannula 400. The nasal prong module may be arranged to receive the flow of respiratory gases for delivery to the patient, e.g., to the upper airway of the patient.

[0555] In some examples, the nasal prong module may be arranged to be selectively and/or removably coupled, for example, mechanically and/or fluidly (e.g., pneumatically) to one or both of the frame 402 and the coupling member 404. For example, the nasal prong module may be arranged to be selectively and/or removably coupled with the frame 402, e.g., adjacent the posterior side of the frame 402 in use. In some examples, the frame 402 and/or the coupling member 404 may be arranged to support the nasal prong module in an operative position, e.g., in fluid communication with the frame 402 and/or coupling member 404 and/or positioned at an upper lip region

of the patient in use. Some examples of the nasal prong module comprise, but are not limited to:

- nasal prong module 408 shown in FIG. 9 to FIG. 22. The nasal prong module 408 may comprise any one or both of first nasal prong 406a and second nasal prong 406b described above.
- nasal prong module 508 shown in FIG. 23 to FIG. 25. The nasal prong module 508 may comprise any one or both of first nasal prong 506a and second nasal prong 506b described above.
- nasal prong module 608 shown in FIG. 26 to FIG. 28. The nasal prong module 608 may comprise any one or both of first nasal prong 606a and second nasal prong 606b described above.
- nasal prong module 708 shown in FIG. 29 to FIG. 31. The nasal prong module 708 may comprise any one or both of first nasal prong 706a and second nasal prong 707b described above.

[0556] By providing a nasal prong module (that may comprise the at least one nasal prong) which can be selectively and/or removably coupled to a portion of the nasal cannula 400, it is possible to change the at least one nasal prong (and therefore of the nasal cannula 400). This can provide the ability to reversibly modify the nasal prong geometry of the nasal cannula 400, e.g., by interchangeably removably coupling two or more nasal prong modules, each comprising a different nasal prong geometry. Therefore, the use of removably couplable nasal prong module(s) allows for the nasal cannula 400 to comprise any one of a variety of nasal prong geometries and selectively interchange between the nasal prong geometries, as required.

[0557] Further, by providing nasal prong module(s) as described above, it is possible to provide two or more nasal prong modules comprising identical (or substantially similar) nasal prong geometries. This has the potential benefit of providing the same type of therapy (e.g., nasal high flow therapy) to the patient, while avoiding prolonged interruptions, if the at least one nasal prong requires replacing, e.g., if the at least one nasal prong is no longer fully functional, is damaged and/or is lost. Additionally, it is also possible to at least temporarily remove and replace a nasal prong module for maintenance purposes (e.g., for cleaning), without having to have prolonged interruptions or unwanted alterations to the therapy being provided to the patient.

[0558] Additionally or alternatively, each nasal prong module may comprise or be at least partially made of a material that is different to that of other nasal prong module(s). The material may be different in any one or more aspects, comprising but not limited

to: material type or composition, material grade or hardness, rigidity and thickness. Thus, by providing the nasal prong module(s) as described above, it is also possible to alter the material of the nasal prong module if/when required. For example, this may be beneficial if it is desirable to alter the properties of material of the nasal cannula 400 contacting the patient or alter the material of the at least nasal prong, to suit patient's needs.

[0559] As mentioned above, the type or variant of therapy being provided to the patient by the respiratory support system is at least in part determined by the nasal prong geometry of the nasal prong module that is removably coupled to the nasal cannula 400. In some examples, the type of therapy being provided may be determined by the selection and removably coupling of the nasal prong module to the nasal cannula 400, without the need for a change to any other configuration and/or setting of the respiratory support system.

Nasal Cannula System

[0560] In some examples, a nasal cannula system comprising two or more nasal prong modules may be provided. The nasal cannula system may comprise the nasal cannula 400 and its features mentioned above. Any one of the two or more nasal prong modules may be selectively and/or removably coupled (e.g., mechanically and/or fluidly, e.g., pneumatically) to the nasal cannula 400 of the nasal cannula system. The nasal prong module that is coupled to the nasal cannula 400 may be removed and replaced by another nasal prong module of the two or more nasal prong modules of the nasal cannula system. In other words, the nasal prong module coupled with the nasal cannula 400 may be interchangeably removably coupled with the remaining nasal prong module(s) of the two or more nasal prong modules.

[0561] This provides, for example, the possibility of selectively choosing a nasal prong module (and therefore a nasal prong geometry and/or material(s)) that is most suitable and/or serving to the needs of the patient. The needs of the patient may comprise and/or depend on a number of factors, which comprise but are not limited to, any one or more of: the type or variant of therapy required and/or recommended, the geometry of the at least one nasal prong (e.g., prong size, shape and/or symmetry/asymmetry) that is most suitable to the patient (e.g., to the patient's nares), the material that is most suitable and/or comfortable, and minimizing or at least reducing the likelihood of interference and/or obstruction of the at nasal cannula 400 (and/or provision of the flow of respiratory gases to the patient) and/or other devices or objects being used by the patient.

[0562] Further, not only is it true that the needs of one patient can be different to those of another, the needs of the same patient can also change throughout therapy. For example, for the same patient, a first nasal prong geometry providing a first therapy (e.g., asymmetric nasal prong geometry that may be providing asymmetric nasal high flow therapy) may be beneficial for an initial phase of therapy, after which a second nasal prong geometry providing a second therapy (e.g., symmetric nasal prong geometry that may be providing symmetric nasal high flow therapy) may be preferred, e.g., more comfortable or effective. In some examples, as the patient respiratory rate reduces/improves during therapy, they may require weaning from therapy and so a change in the nasal prong geometry, and therefore the therapy being provided, may be useful. For example, it may be useful to switch from an asymmetric nasal prong geometry to a symmetric nasal prong geometry, and/or vice versa. Thus, the use of different nasal prong geometries may be preferred and/or trialed in different phases of a therapy.

[0563] Symmetric nasal high flow therapy and asymmetric nasal high flow therapy are different variants of nasal high flow therapy. An asymmetric nasal prong geometry and/or asymmetric nasal high flow therapy may provide improved flushing (CO₂ clearance) and/or increased pressure compared to an equivalent symmetric nasal prong geometry and/or symmetric nasal high flow therapy at the same flow rates. Or similar flushing and/or pressure at a lower flow rate.

[0564] In some examples, it may be useful to maintain the nasal prong geometry (e.g., asymmetric nasal prong geometry or symmetric nasal prong geometry) and instead change the nasal prong module to change the material (of at least a portion of the nasal prong module) and/or change the size of the at least one nasal prong. This may (i) improve patient comfort and/or effect of therapy and/or (ii) reduce the likelihood of interference/obstruction of the nasal cannula 400 and/or other devices (e.g., a nasogastric tube) being used by the patient.

[0565] In some examples, a nasal prong module (and therefore a nasal prong geometry and/or material of at least a portion of the nasal prong module) may be selectively coupled with the nasal cannula 400 to minimize or reduce the likelihood of interference and/or obstruction of the nasal cannula 400 and/or other devices/objects being used by the patient. The devices and/or objects may comprise those located at or near the patient's mouth and/or nose (e.g., a nasogastric tube). This may enhance patient comfort, as well device performance and versatility, e.g., by reducing likelihood of device obstruction.

[0566] Further, by providing the ability to change between two or more nasal prong geometries (e.g., between the left asymmetric nasal prong geometry and the right

asymmetric nasal prong geometry), it is possible to provide a nasal prong geometry (and therefore a nasal cannula 400) that is relatively more suitable and/or is more tailored to the shape/structure of the patient's nares (e.g., providing an asymmetric nasal prong geometry prongs that is suitable for a nasal asymmetry of the patient). Moreover, by providing the ability to change between two or more nasal prong modules (e.g., of different nasal prong geometries), it may be possible to selectively choose and couple a nasal prong module which prevents, reduces the likelihood of and/or accommodates for injuries and/or discomfort of the patient, that would otherwise be adversely affected by other/certain nasal prong geometries. In some applications, e.g., home therapies, injuries and/or discomfort may be experienced by the patient due to prolonged use of a certain nasal prong geometry and/or material(s). As mentioned above, this may be avoided by interchanging between two or more nasal prong modules (i.e., interchangeably removably coupling the two or more nasal prong modules to the nasal cannula 400), which may be different in one or more aspects such as nasal prong geometry and prong size and/or may comprise or be at least partially made of a different material.

[0567] The nasal cannula system may comprise a first nasal prong module and a second nasal prong module. The first nasal prong module may comprise a first nasal prong geometry. The second nasal prong module may comprise a second nasal prong geometry. The first nasal prong geometry may be different to the second nasal prong geometry or may be identical (or substantially similar).

[0568] The first nasal prong module (and the first nasal prong geometry) may be arranged to provide a first therapy to the patient. The second nasal prong module (and the second nasal prong geometry) may be arranged to provide a second therapy to the patient. The first therapy may be different (i.e., may provide a different type or variant of therapy) to the second therapy. In some examples, the provision of the first therapy or the second therapy by the respiratory support system to the patient, may be at least in part determined by selection and/or coupling of the first nasal prong module or the second nasal prong module, e.g., without the need for a change to any other configuration and/or setting of the respiratory support system.

[0569] In some examples, the at least one nasal prong of the nasal prong module (e.g., any one or both of the first nasal prong module and the second nasal prong module) may be arranged to only partially occlude at least one of the left nostril and the right nostril of the patient.

[0570] In some examples, the first nasal prong module (and the first nasal prong geometry) may comprise a first symmetric nasal prong geometry, e.g., the nasal prong module 408 shown in FIG. 9 to FIG. 22, and the second nasal prong module (and the

second nasal prong geometry) may comprise a second symmetric nasal prong geometry, e.g., the nasal prong module 508 shown in FIG. 23 to FIG. 25, that is different to the first symmetric nasal prong geometry (e.g., in the one or more aspects mentioned above such as prong size and/or internal/external diameter (e.g., transverse diameter) or cross-sectional area or perimeter).

[0571] The first therapy (e.g., first variant of nasal high flow therapy) may be one of the asymmetric nasal high flow therapy or a symmetric nasal high flow therapy. The second therapy (e.g., second variant of nasal high flow therapy) may be the other of the symmetric nasal high flow therapy or the asymmetric nasal high flow therapy. In a possible example, the first nasal prong module may comprise a symmetric nasal prong geometry, e.g., nasal prong geometry of the nasal prong module 408 or the nasal prong module 508, and the second nasal prong module may comprise an asymmetric nasal prong geometry, e.g., nasal prong geometry of the nasal prong module 608 or the nasal prong module 708.

[0572] In some examples, the first nasal prong module (and the first nasal prong geometry) and the second nasal prong module (and the second nasal prong geometry) may comprise an asymmetric nasal prong geometry that may be different to each other (e.g., in the one or more aspects mentioned above). The first nasal prong module may comprise a left asymmetric nasal prong geometry, e.g., the nasal prong module 608 shown in the example of FIG. 26 to FIG. 28, and the second nasal prong module may comprise a right asymmetric nasal prong geometry, e.g., the nasal prong module 708 shown in the example of FIG. 29 to FIG. 31.

[0573] In some examples, the first nasal prong module (and the first nasal prong geometry) and the second nasal prong module (and the second nasal prong geometry) may both comprise a left asymmetric nasal prong geometry or a right asymmetric nasal prong geometry. The first and second nasal prongs of the first nasal prong module may be different to the first and second nasal prongs of the second nasal prong module, respectively, e.g., in any one or more of the aspects mentioned above. For example, the size or internal/external diameter (e.g., transverse diameter) or cross-sectional area or perimeter of the first nasal prong of the first nasal prong module may be different (i.e., bigger or smaller) to that of the first nasal prong of the second nasal prong module. Additionally or alternatively, the size or internal/external diameter (e.g., transverse diameter) or cross-sectional area or perimeter of the second nasal prong of the first nasal prong module may be different (i.e., bigger or smaller) to that of the second nasal prong of the second nasal prong module.

[0574] In some examples, the nasal cannula system may comprise a third nasal prong module. The third nasal prong module may comprise a third nasal prong geometry. The

third nasal prong geometry may be different to the first nasal prong geometry and/or the second nasal prong geometry in any one or more of the aspects mentioned above. The third nasal prong geometry may comprise a symmetric nasal prong geometry or an asymmetric nasal prong geometry, such as those described above. In some examples, the third nasal prong geometry may comprise an asymmetric nasal prong geometry, where the at least one nasal prong (e.g., the first and second nasal prongs) are different in one or more aspects, e.g., prong size, in comparison to that of any one or both of the first nasal prong geometry and the second nasal prong geometry. For example, the size and/or internal/external diameter (e.g., transverse diameter) or cross-sectional area or perimeter of the first nasal prong of the third nasal prong geometry may be different (i.e., bigger or smaller) to that of the first nasal prong of any one or both of the first and second nasal prong geometries. Further, the size or internal/external diameter (e.g., transverse diameter) or cross-sectional area or perimeter of the second nasal prong of the third nasal prong geometry may be different (i.e., bigger or smaller) to that of the second nasal prong of any one or both of the first and second nasal prong geometries.

[0575] In one example, the third nasal prong geometry may be or may form a left asymmetric nasal prong geometry such that: an internal transverse dimension or cross-sectional area of the third left nasal prong may be greater than a corresponding internal transverse dimension or cross-sectional area of the third right nasal prong; and/or an external transverse dimension or cross-sectional area of the third left nasal prong may be greater than a corresponding external transverse dimension or cross-sectional area of the third right nasal prong. The third left nasal prong may be arranged to provide a greater volumetric flow rate than the third right nasal prong.

[0576] In another example, the third nasal prong geometry may be or may form a right asymmetric nasal prong geometry such that: an internal transverse dimension or cross-sectional area of the third right nasal prong may be greater than a corresponding internal transverse dimension or cross-sectional area of the third left nasal prong; and/or an external transverse dimension or cross-sectional area of the third right nasal prong may be greater than a corresponding external transverse dimension or cross-sectional area of the third left nasal prong. The third right nasal prong may be arranged to provide a greater volumetric flow rate than the third left nasal prong.

[0577] In examples where the first and second nasal prong modules (and the third nasal prong module, if present) all comprise or form any one of a left asymmetric nasal prong geometry, a right asymmetric nasal prong geometry or a symmetric geometry, the following may apply. The internal transverse dimension or cross-sectional area of the first left nasal prong may be greater than the internal transverse dimension or cross-sectional area of the second left nasal prong and/or the external transverse dimension

or cross-sectional area of the first left nasal prong may be greater than the external transverse dimension or cross-sectional area of the second left nasal prong. The internal transverse dimension or cross-sectional area of the second left nasal prong may be greater than the internal transverse dimension or cross-sectional area of the third left nasal prong; and/or the external transverse dimension or cross-sectional area of the second left nasal prong may be greater than the external transverse dimension or cross-sectional area of the third left nasal prong.

[0578] In some examples, the nasal cannula system may comprise a fourth nasal prong module. The fourth nasal prong module may comprise a fourth nasal prong geometry. The fourth nasal prong geometry may be different to any one or more of the first nasal prong geometry, the second nasal prong geometry and the third nasal prong geometry. The fourth nasal prong geometry may comprise a symmetric nasal prong geometry or an asymmetric nasal prong geometry, such as those described above. In some examples, the fourth nasal prong geometry may comprise an asymmetric nasal prong geometry, where the at least one nasal prong are different in one or more aspects, e.g., prong size, in comparison to the respective nasal prong of any one or more of the first, second and third nasal prong geometries. For example, the size or internal/external diameter or (e.g., transverse diameter) or cross-sectional area perimeter of the first nasal prong of the fourth nasal prong geometry may be different (i.e., bigger or smaller) to that of the first nasal prong of any one or more of the first, second and third nasal prong geometries. Further, the size and/or internal/external diameter (e.g., transverse diameter) or cross-sectional area or perimeter of the second nasal prong of the fourth nasal prong geometry may be different (i.e., bigger or smaller) to that of the second nasal prong of any one or more of the first, second and third nasal prong geometries.

[0579] In some examples, the nasal cannula system may comprise additional prong modules, i.e., more than four nasal prong module, which may be interchangeably couplable to the nasal cannula 400 (e.g., to the frame 402 and/or coupling member 404).

[0580] In some examples, there may be provided a kit of parts. The kit of parts may comprise at least one nasal prong module (e.g., any one or more of the first, second, third, and fourth nasal prong modules). The kit of parts may comprise any one or more of: the frame 402, the coupling member 404, at least one pin 412 (shown in FIG. 7), the at least one inlet conduit 302, the coupling member connector 405 (which may be arranged to couple the inlet conduit 302 with the coupling member 404), the at least one swivel connector (which may be arranged to couple the inlet conduit 302 with an inspiratory conduit), and the headgear 306. In some examples, the kit of parts may comprise two or more nasal prong modules. For example, the kit of parts may comprise a first nasal prong module forming a left asymmetric nasal prong geometry and a second

nasal prong module forming a right asymmetric nasal prong geometry. Alternatively, the nasal prong geometry of the first and second nasal prong modules may be at least substantially similar or identical (e.g., both forming a left asymmetric nasal prong geometry or a right asymmetric nasal prong geometry).

[0581] In another example, the kit of parts may comprise a first nasal prong module (having a first left nasal prong and a first right nasal prong) comprising or forming a left asymmetric nasal prong geometry and a second nasal prong module (having a second left nasal prong and a second right nasal prong) comprising or forming a left asymmetric nasal prong geometry. In this example, the internal transverse dimension or cross-sectional area of the first left nasal prong may be greater than the internal transverse dimension or cross-sectional area of the second left nasal prong and/or the external transverse dimension or cross-sectional area of the first left nasal prong may be greater than the external transverse dimension or cross-sectional area of the second left nasal prong. Alternatively, or additionally, the internal transverse dimension or cross-sectional area of the first right nasal prong may be greater than the internal transverse dimension or cross-sectional area of the second right nasal prong and/or the external transverse dimension or cross-sectional area of the first right nasal prong may be greater than the external transverse dimension or cross-sectional area of the second right nasal prong.

[0582] The kit of parts may comprise a third nasal prong module (having a third left nasal prong and a third right nasal prong) comprising or forming a left asymmetric nasal prong geometry. The internal transverse dimension or cross-sectional area of the second left nasal prong may be greater than the internal transverse dimension or cross-sectional area of the third left nasal prong; and/or the external transverse dimension or cross-sectional area of the second left nasal prong may be greater than the external transverse dimension or cross-sectional area of the third left nasal prong. Alternatively, or additionally, the internal transverse dimension or cross-sectional area of the second right nasal prong may be greater than the internal transverse dimension or cross-sectional area of the third right nasal prong; and/or the external transverse dimension or cross-sectional area of the second right nasal prong may be greater than the external transverse dimension or cross-sectional area of the third right nasal prong.

[0583] In another example, the kit of parts may comprise a first nasal prong module (having a first left nasal prong and a first right nasal prong) comprising or forming a right asymmetric nasal prong geometry and a second nasal prong module (having a second left nasal prong and a second right nasal prong) comprising or forming a right asymmetric nasal prong geometry. In this example, the internal transverse dimension or cross-sectional area of the first left nasal prong may be greater than the internal transverse dimension or cross-sectional area of the second left nasal prong and/or the external transverse dimension or cross-sectional area of the first left nasal prong may

be greater than the external transverse dimension or cross-sectional area of the second left nasal prong. Alternatively, or additionally, the internal transverse dimension or cross-sectional area of the first right nasal prong may be greater than the internal transverse dimension or cross-sectional area of the second right nasal prong and/or the external transverse dimension or cross-sectional area of the first right nasal prong may be greater than the external transverse dimension or cross-sectional area of the second right nasal prong.

[0584] The kit of parts may comprise a third nasal prong module (having a third left nasal prong and a third right nasal prong) comprising or forming a right asymmetric nasal prong geometry. The internal transverse dimension or cross-sectional area of the second left nasal prong may be greater than the internal transverse dimension or cross-sectional area of the third left nasal prong; and/or the external transverse dimension or cross-sectional area of the second left nasal prong may be greater than the external transverse dimension or cross-sectional area of the third left nasal prong. Alternatively, or additionally, the internal transverse dimension or cross-sectional area of the second right nasal prong may be greater than the internal transverse dimension or cross-sectional area of the third right nasal prong; and/or the external transverse dimension or cross-sectional area of the second right nasal prong may be greater than the external transverse dimension or cross-sectional area of the third right nasal prong.

[0585] In some examples, the kit of parts may comprise any one or more of the inspiratory conduit 140, the connector 142, the connector 144, the humidifier supply conduit 120 and the filter 114.

Base portion

[0586] In some examples, the nasal prong module may comprise a base portion 420. The base portion 420 may be arranged to be removably coupled with any one or both of the frame 402 and the coupling member 404 of the nasal cannula 400. In some examples, the nasal prong module may comprise a body portion 440. The base portion 420 may be coupled or attached to the body portion 440. In some examples, the base portion 420 and the body portion 440 may be integrally formed. For example, the body portion 440 may be overmolded to the base portion 420.

[0587] The body portion 440 may be arranged to receive the flow of respiratory gases for delivery to the patient, e.g., to the upper airway of the patient. In some examples, the at least one nasal prong may be arranged to be fluidly (e.g., pneumatically) coupled with the body portion 440 and/or the base portion 420. In some examples, the at least one nasal prong may extend from the body portion 440.

[0588] Possible examples of features of the nasal prong module are described below with reference to the nasal prong module 408. While the following features have been described with reference to the nasal prong module 408 (e.g., with reference to its base portion 420 and body portion 440), it should be appreciated that these features may also be incorporated/comprised into the arrangement of other possible examples of the nasal prong module described herein, such as any one or more of the nasal prong module 508, the nasal prong module 608 and the nasal prong module 708.

[0589] With reference to FIG. 9 and FIG. 10, the nasal prong module 408 may comprise a base portion 420 and/or a body portion 440. The body portion 440 may be coupled with the base portion 420. The at least one nasal prong 406 (e.g., the first nasal prong 406a and the second nasal prong 406b) may be arranged to be fluidly (e.g., pneumatically) coupled with the body portion 440 and/or the base portion 420. In some examples, at least a portion (e.g., a distal portion) of each of the at least one nasal prong (e.g., at least one nasal prong 406, 506, 606, 706) may be arranged such that it may project or extend from a first longitudinal side wall and/or a posterior wall of the body portion (explained further below). The projection or extension direction may be away from the base portion.

[0590] The nasal prong module 408, e.g., the base portion 420, may be arranged to be selectively and/or removably coupled (e.g., fluidly) with the frame 402, e.g., adjacent the posterior side of the frame 402.

[0591] In some examples, the nasal prong module 408 (e.g., the base portion 420) may comprise at least one gases inlet aperture 450. The at least one gases inlet aperture 450 may be arranged to be in fluid communication with the at least one inlet conduit 302. In some examples, the at least one gases inlet aperture 450 may be arranged to be (directly or indirectly) fluidly, e.g., pneumatically, coupled with the at least one nasal prong 406. The at least one gases inlet aperture 450 may be arranged to receive the flow of respiratory gases for supply to the body portion 440 and the at least one nasal prong 406 (e.g., any one or both of the first nasal prong 406a and the second nasal prong 406b).

[0592] In some examples, the at least one gases inlet aperture 450 may comprise a first gases inlet aperture 450a and a second gases inlet aperture 450b. The first nasal prong 406a may be arranged to be (directly or indirectly) fluidly (e.g., pneumatically) coupled with the first gases inlet aperture 450a. The second nasal prong 406b may be arranged to be (directly or indirectly) fluidly (e.g., pneumatically) coupled with the second gases inlet aperture 450b.

[0593] The at least one gases inlet aperture 450 may be arranged to be (directly or indirectly) removably and/or fluidly (e.g., pneumatically) coupled with the at least one outlet opening 414 of the frame 402. In some examples, the first gases inlet aperture 450a may be arranged to be (directly or indirectly) removably and/or fluidly (e.g., pneumatically) coupled with the first outlet opening 414a of the frame 402 and the second gases inlet aperture 450b of the nasal prong module 408 may be arranged to be (directly or indirectly) removably and/or fluidly (e.g., pneumatically) coupled with the second outlet opening 414b of the frame 402, e.g., for receiving the flow of respiratory gases. Therefore, the at least nasal prong 406 may be arranged to be (directly or indirectly) removably and/or fluidly (e.g., pneumatically) coupled with the at least one outlet opening 414 of the frame 402, e.g., for receiving the flow of respiratory gases. For example, the first nasal prong 406a may be arranged to be coupled to the first outlet opening 414a and/or the second nasal prong 406b may be arranged to be coupled to the second outlet opening 414b.

[0594] In some examples, the nasal prong module 408 (e.g., the base portion 420) may be arranged to form a seal (e.g., a face seal and/or an annular seal) with the frame 402. The features forming the seal may comprise the at least one outlet opening 414 of the frame 402, such as any one or both of the first outlet opening 414a and second outlet opening 414b.

[0595] The base portion 420 may comprise one or more (e.g., a single) recesses 430. The one or more recesses 430 may be arranged to prevent the nasal prong module 408 from interfering with or obstructing the at least one pin 412. Additionally or alternatively, the one or more recesses 430 may be arranged to receive (e.g., sealingly and/or removably) a corresponding portion of the nasal cannula 400, e.g., a portion of the frame 402 and/or the at least one pin 412. In some examples, the one or more recesses 430 may be positioned intermediate the first gases inlet aperture 450a and the second gases inlet aperture 450b. The one or more recesses 430 may comprise any shape that is complementary to that of the corresponding portion of the nasal cannula 400 (e.g., at least one pin 412). For example, the one or more recesses 430 and the corresponding portion of the nasal cannula 400 may be circular or rectangular.

[0596] The base portion 420 may be at least partially made from a first material and the body portion 440 may be at least partially made from a second material. In some examples, the first material may be different to the second material. In some examples, first material may be more rigid than the second material. This may provide the base portion 420 with an improved structural integrity, e.g., relative to the body portion 440. In some examples, the second material may be more flexible and/or stretchable than the first material.

[0597] Alternatively, the first material and the second material may be the same. In some examples, the base portion 420 and the body portion 440 may be provided in a single molding.

[0598] In some examples, the body portion 440 may be at least partially made from an elastomer (e.g., silicone rubber and/or thermoplastic elastomer). In some examples, the base portion 420 may be at least partially made from any material(s) that is able to chemically and/or physically bonds to the bond to the body portion 440, such as any one of polypropylene (PP), nylon, acrylonitrile butadiene styrene (ABS), polycarbonate (PC), and polyoxymethylene (POM). In some examples, at least a portion of the base portion 420 may be opaque. In some examples, at least a portion of the body portion 440 may be translucent.

[0599] In some examples, at least a portion of the base portion 420 may be a different color to at least a portion of the body portion 440. In some examples, the color of the entire base portion 420 is different to color of the entire body portion 440.

[0600] In some examples, the base portion 420 may comprise at least one color. The at least one color may be associated with the nasal prong geometry of the at least one nasal prong 406. The at least one color may comprise a first color and a second color. The first color may be associated with the geometry of the first nasal prong 406a. The second color may be associated with the geometry of the second nasal prong 406b.

[0601] In some examples, e.g., where the nasal prong module may comprise a symmetric nasal prong geometry such as nasal prong module 408 or nasal prong module 508), the first color may be the same as the second color. In some examples, e.g., where the nasal prong module may comprise an asymmetric nasal prong geometry (such as nasal prong nasal prong module 608 or nasal prong module 708), the first color may be different to the second color.

[0602] In some examples, the at least one color of a first nasal prong module comprising a first symmetric nasal prong geometry may be different to the at least one color of a second nasal prong module comprising a second symmetric nasal prong geometry that may be different to the first symmetric nasal prong geometry in one or more aspects (e.g., prong size).

[0603] In some examples, the at least one color of a first nasal prong module comprising a first asymmetric nasal prong geometry may be different to the at least one color of a second nasal prong module comprising a second asymmetric nasal prong geometry that may be different to the first asymmetric nasal prong geometry in one or more aspects. The first nasal prong module and the second nasal prong module may each comprise a first color and a second color that are different to each other. The first

color may be associated with the left nasal prong (e.g., first nasal prong 606a and first nasal prong 706a) and the second color may be associated with the right nasal prong (e.g., second nasal prong 606b and second nasal prong 707b).

[0604] For example, a first nasal prong module (e.g., nasal prong module 608) may comprise a first asymmetric nasal prong geometry that may be a mirror-image of a second asymmetric nasal prong geometry of a second nasal prong module (e.g., nasal prong module 708). The arrangement of the at least one color of the first nasal prong module may be a mirror-image of the arrangement of the at least one color of the second nasal prong module. For example, the first color of the first nasal prong module may be at least substantially the same/similar to the second color of the second nasal prong module and/or second color of the first nasal prong module may be at least substantially the same/similar to the first color of the first nasal prong module.

[0605] In some examples, the base portion 420 may comprise a curved plate structure. The base portion 420 may comprise a central waist region. In some examples, the base portion 420 may comprise a first longitudinal side 421 (e.g., an upper side) and/or a second longitudinal side 422 (e.g., a lower side), as shown in FIG. 10. The first longitudinal side 421 and the second longitudinal side 422 may be positioned opposite each other. The first longitudinal side 421 and/or second longitudinal side 422 may at least in part taper towards the central waist region, e.g., from one or both sides of the respective longitudinal side. In some examples, the distance between the first longitudinal side 421 and the second longitudinal side 422 may define a height of the body portion. The height of the body portion may at least in part taper towards the central waist region.

[0606] In some examples, the base portion 420 may be arranged to resiliently flex, e.g., upon removal of the nasal prong module from the frame 402.

[0607] In some examples, the base portion 420 may be arranged to couple with the frame 402 in only a single orientation.

[0608] As shown in FIG. 9 to FIG. 22, the nasal prong module 408 (e.g., the base portion 420) may comprise one or more coupling structures 480. The one or more coupling structure 480 may be arranged to engage and/or cooperate with at least a portion of the frame 402, e.g., one or more corresponding attachment structures 490 of the frame 402 (such as those shown in FIG. 8, FIG. 35 and FIG. 36). The one or more coupling structure 480 may be arranged to deflect (e.g., reversibly and/or resiliently deflect) and at least partially recover as the nasal prong module 408 (e.g., base portion 420) is coupled with and/or decoupled from the frame 402.

[0609] Each of the one or more coupling structure 480 may comprise a protrusion (e.g., as shown in FIG. 18). The protrusion may be arranged to mate or engage with a recess or underside portion of the respective one or more attachment structure 490 of the frame 402. In some examples, each protrusion may be located on an inward surface of the respective coupling structure 480. Each protrusion may be located on, at or proximate to a distal end of the respective coupling structure 480. The distal end of the coupling structure 480 may be the end that is furthest away from the body portion 440.

[0610] In some examples, the one or more coupling structure 480 may comprise a pair of coupling structures 480. The pair of coupling structure 480 may be arranged to cooperate with a corresponding pair of attachment structures 490 of the frame 402. The pair of coupling structure 480 may be located in an opposing relationship. In some examples, one of the pair of coupling structure 480 may be located on the first longitudinal side 421 (e.g., an upper side, in use) of the base portion 420 and the other of the pair of coupling structure 480 may be located on the second longitudinal side 422 (e.g., a lower side, in use) of the base portion 420.

[0611] In some examples, one of the pair of coupling structure 480 may comprise a first coupling structure and the other of the pair of coupling structure 480 may comprise a second coupling structure. The first coupling structure may comprise a first coupling structure geometry and the second coupling structure may comprise a second coupling structure geometry. The first coupling structure geometry and the second coupling structure geometry may be different from each other. In some examples, the first coupling structure may be wider than the second coupling structure. The size/width of the attachment structure 490 may be arranged such that it corresponds to the size/width of the coupling structure 480 it is arranged to receive. For example, in a pair of 490, one of the pair of attachment structures 490 arranged to be coupled to a first coupling structure (that is wider than a second coupling structure) may be wider than the other of the pair of attachment structures 490.

[0612] In some examples, the first coupling structure may be located in a central portion of the first longitudinal side 421 (also referred to as a "lower central region") of the base portion 420 and the second coupling structure may be located in a central portion of the second longitudinal side 422 (also referred to as "an upper central region") of the base portion 420.

[0613] In some examples, the one or more coupling structure 480 may be bisected by the sagittal plane S. The one or more coupling structure 480 may be arranged to project in an anterior direction, e.g., away from the body portion 440 and/or in use.

[0614] In some examples, the coupling between the nasal prong module 408 (e.g., the base portion 420) and the frame 402 may be provided by a removable snap fit mechanism. The coupling between the nasal prong module 408 and the frame 402 (e.g., the removable snap fit) may be arranged to provide any one or more of: tactile feedback; audible feedback; and visual feedback. The visual feedback may comprise one or more coupling structures 480 abutting or being proximate to the coupling member 404. In other words, when the one or more coupling structure 480 are not abutting or proximate to the coupling member 404 when coupling with the frame 402, it may provide visual feedback that the nasal prong module 408 has not appropriately/completely coupled with the frame 402. The audible feedback may comprise a generation of a sound upon the coupling of the nasal prong module 408 (e.g., the removable snap fit) with the frame 402.

[0615] In some examples, at least one of the one or more coupling structures 480 (e.g., at least one of a pair of coupling structures) may comprise at least one slot 481. The at least one slot 481 may be centrally located on the respective coupling structure 480 (e.g., as shown in FIG. 37). The frame 402 (e.g., at least one of the one or more attachment structure 490) may comprise at least one protrusion 491. The at least one slot 481 may be arranged to cooperate with and/or receive a corresponding/respective protrusion 491. For example, each slot 481 may be arranged to be reciprocally keyed by a corresponding/respective protrusion 491. In some of the examples where the base portion 420 comprises a pair of coupling structure 480, only one of the pair of coupling structures 480 may comprise the at least one slot 481, which may be arranged to cooperate with and/or receive at least one protrusion 491 of the corresponding or respective attachment structure 490. For example, only the first coupling structure or only the second coupling structure (discussed above) may comprise at least one (e.g., a single) slot 481 each arranged to cooperate with and/or receive a protrusion 491 of the corresponding or respective attachment structure 490. By providing the at least one slot 481 on only one coupling structure 480, it may be possible to provide visual cues regarding the correct orientation of the nasal prong module 408 with respect to the frame 402 and/or coupling member 404. This, alternatively or additionally to one of the coupling structures being wider than the other coupling structure(s), may prevent or reduce the likelihood of the user attempting to couple the nasal prong module 408 to the frame 402 and/or coupling member 404 in an incorrect (and unintended) orientation. In other words, any one or both of (a) one of the coupling structures being wider than the other coupling structure(s) and (b) the at least one slot 481 being provided (e.g., on only one coupling structure 480), may provide visual cues regarding the correct orientation of the nasal prong module 408 with respect to the frame 402 and/or coupling member 404. In some examples, there is only one correct orientation in which the nasal prong module 408 is coupled to the frame 402 and/or the coupling member 404.

[0616] Alternatively, both of the first coupling structure and the second coupling structure may comprise at least one slot 481, e.g., where the number of and/or dimensions of slots of one coupling structure may be different to that of the other coupling structure(s).

[0617] The one or more coupling structures 480 of the base portion 420 of the nasal prong module and the one or more attachment structures 490 of the frame 402 may be arranged to torque-proofly couple the base portion 420 to the frame 402 by moving the base portion 420 and the frame 402 translationally towards each other in at least one of the anterior direction and the posterior direction. In some examples, the base portion 420 and the frame 402 are torque-proofly coupled to each other only by moving the base portion 420 and the frame 402 translationally towards each other in at least one of the anterior and posterior directions. Said translational movement along the at least one of the anterior and posterior directions may bring the one or more coupling structures 480 into engagement with the one or more attachment structures 490. The coupling between the base portion 420 and the frame 402 may be torque-proof such that both components may not be rotated relatively to each other. In one example, the coupling between the base portion 420 and the frame 402 fixates the base portion 420 to the frame 402 rigidly such that both components may not be moved relatively to each other, neither translationally nor rotatory.

Body Portion

[0618] In some examples, the at least one nasal prong 406 may extend from the body portion 440. The body portion 440 may be arranged to deliver the flow of respiratory gases to the patient through the at least one nasal prong 406 (e.g., any one or both of the first nasal prong 406a and the second nasal prong 406b).

[0619] The nasal prong module 408, e.g., the body portion 440, may comprise at least one gas carrying portion 460 (for example, as shown in FIG. 10, FIG. 11 and FIG. 16). The at least one gas carrying portion 460 may be arranged to fluidly (e.g., pneumatically) couple with the at least one gases inlet aperture 450. The at least one gas carrying portion 460 may be arranged to provide gas flow path(s) for the flow of respiratory gases. The at least one gas carrying portion 460 may be arranged to fluidly (e.g., pneumatically) couple the at least one nasal prong 406 with the at least one gases inlet aperture 450 of the nasal prong module 408.

[0620] The at least one gas carrying portion 460 may comprise a first gas carrying portion 460a. In some examples, the first gas carrying portion 460a may be arranged to pneumatically couple the first nasal prong 406a with the first gases inlet aperture 450a of the nasal prong module 408 (e.g., of the base portion 420). The at least one

gas carrying portion 460 may comprise a second gas carrying portion 460b. In some examples, the second gas carrying portion 460b may be arranged to pneumatically couple the second nasal prong 406b with the second gases inlet aperture 450b of the nasal prong module 408 (e.g., of the base portion 420). Therefore, the first gas carrying portion 460a may be arranged to be fluidly (e.g., pneumatically) coupled with the first gases inlet aperture 450a and the first nasal prong 406a and the second gas carrying portion 460b may be arranged to be fluidly (e.g., pneumatically) coupled with the second gases inlet aperture 450b and the second nasal prong 406b.

[0621] In some examples, one or more of the at least one gases inlet aperture 450 may be arranged at least substantially coaxially with an inlet end of a corresponding gas carrying portion 460. For example, the first gases inlet aperture 450a may be arranged at least substantially coaxially with at inlet end of the first gas carrying portion 460a and/or the second gases inlet aperture 450b may be arranged at least substantially coaxially with an inlet end of the second gas carrying portion 460b.

[0622] In some examples, one or more of the at least one gases inlet aperture 450 may comprise an internal diameter (e.g., transverse diameter) or cross-sectional area or perimeter that is equal to or greater than an internal diameter (e.g., transverse diameter) or cross-sectional area or perimeter of a respective gas carrying portion 460. For example, the first gases inlet aperture 450a may comprise an internal diameter (e.g., transverse diameter) or cross-sectional area or perimeter that is equal to or greater than an internal diameter (e.g., transverse diameter) or cross-sectional area or perimeter of the first gas carrying portion 460a (e.g., internal diameter or perimeter of the inlet end of the first gas carrying portion 460a) and/or the second gases inlet aperture 450b may comprise an internal diameter (e.g., transverse diameter) or cross-sectional area or perimeter that is equal to or greater than an internal diameter (e.g., transverse diameter) or cross-sectional area or perimeter of the second gas carrying portion 460b (e.g., internal diameter (e.g., transverse diameter) or cross-sectional area or perimeter of the inlet end of the second gas carrying portion 460b).

[0623] In some examples, any one or more of the first gases inlet aperture 450a, the first gas carrying portion 460a and the first nasal prong 406a may be arranged to be fluidly (e.g., pneumatically) coupled with the first outlet openings 414a of the frame 402. In some examples, any one or more of the second gases inlet aperture 450b, the second gas carrying portion 460b and the second nasal prong 406b may be arranged to be fluidly (e.g., pneumatically) coupled with the second outlet opening 414b of the frame 402.

[0624] The first gas carrying portion 460a and second gas carrying portion 460b may be separate from each other. For example, the flow of respiratory gases in the first gas

carrying portion 460a may be separate from the flow of respiratory gases in the second gas carrying portion 460b.

[0625] In some examples, the first gas carrying portion and the second gas carrying portion of a nasal prong module comprising a symmetric nasal prong geometry (e.g., the first gas carrying portion 460a and the second gas carrying portion 460b of the nasal prong module 408) may be identical or substantially similar.

[0626] In some examples, the first gas carrying portion and the second gas carrying portion of a nasal prong module comprising an asymmetric nasal prong geometry (e.g., first gas carrying portion 660a and second gas carrying portion 660b of nasal prong module 608) may be different from each other in at least one aspect (e.g., size). For example, the first gas carrying portion 660a may comprise a smaller internal diameter (e.g., transverse diameter) or cross-sectional area or perimeter and/or external diameter (e.g., transverse diameter) or cross-sectional area or perimeter than that of the second gas carrying portion 660b.

[0627] In some examples, the body portion 440 may comprise any one or more of: a first longitudinal side wall 441, a first lateral side wall 442, a second lateral side wall 443 and a posterior wall 444. The posterior wall 444 may comprise a central region 445. The posterior wall 444 (e.g., the central region 445) may comprise a posterior surface 445a and/or an anterior surface 445b, e.g., as shown in FIG. 22. The anterior surface 445b may be opposing the posterior surface 445a. The posterior wall 444 (e.g., the posterior surface 445a) may be arranged to contact and/or engage the upper lip region of the patient.

[0628] In some examples, the posterior surface 445a may comprise a continuous curve. Alternatively, the posterior surface 445a may comprise a non-continuous curve. At least a portion of the continuous curve or non-continuous curve may be arranged to follow a curvature of a portion of the patient's face (e.g., the upper lip region) of the patient. In some examples, the central region 445 and/or the posterior surface 445a may be shaped and/or arranged to accommodate the septum region of the patient's nose in use.

[0629] In some examples, the body portion 440 may comprise at least one lateral extension. For example, the body portion 440 may comprise a pair of lateral extensions (e.g., first lateral extension 471 and a second lateral extension 472 shown in FIG. 12). The at least one lateral extension (e.g., the first lateral extension 471 and the second lateral extension 472) may extend laterally from the posterior wall 444. In some examples, one of a pair of the lateral extensions (e.g., the first lateral extension 471) may extend beyond the first lateral side wall 442 and/or the other of the pair of lateral

extensions (e.g., second lateral extension 472) may extend beyond the second lateral side wall 443.

[0630] The at least one lateral extension (e.g., the pair of lateral extensions) may be relatively broad, relatively thin and/or relatively flexible, in comparison to one or more remaining portions of the body portion 440 and/or the base portion 420. In some examples, the length of each of the at least one lateral extension (e.g., the pair of lateral extensions) is larger or longer than its width. In one example, the length to width ratio of each lateral extension is within the range of 2:1 to 7:1. In some examples, the length of each of the at least one lateral extension (e.g., the pair of lateral extensions) is larger or longer than its thickness. In one example, the length to thickness ratio of each lateral extension is within the range of 3:1 to 10:1.

[0631] The at least at least one lateral extension (e.g., the pair of lateral extensions) may comprise a varying thickness. In some examples, the thickness of each lateral extension may taper from a first end to a second end of the lateral extension. The first end of the lateral extension may be proximate the central region 445 of the posterior wall 444 and the second end may be distal from the central region 445 of the posterior wall 444. In other words, the first end of the lateral extension may be closer to the central region 445 than the second end of the lateral extension.

[0632] In some examples, e.g., as shown in FIG. 32 and FIG. 37, the at least one lateral extension (e.g., the first lateral extension 471 and the second lateral extension 472) may comprise a hinge portion or pivot portion 483. The pivot portion 483 may be arranged to allow the at least one lateral extension to have more flexibility and may provide a wider bending or flexing range. For examples, each lateral extension may be reversibly flexed/bent such that an angle between the lateral extension and the posterior surface 445a and/or the posterior wall 444 can increase to more than 180 degrees and/or can decrease below 90 degrees.

[0633] In some examples, the at least one lateral extension (e.g., distal ends of the pair of lateral extensions) may be arranged to be spaced from the frame 402, before the nasal cannula assembly is fitted to the patient and/or when the nasal cannula assembly is fitted to the patient. In some examples, the at least one lateral extension (e.g., distal ends of the pair of lateral extensions) may be arranged to cushion the patient (e.g., from the frame 402), e.g., when the nasal cannula 400 may be pressed against the face of the patient (e.g., by an external factor or force). In some examples, the at least one lateral extension (e.g., distal ends of the pair of lateral extensions) may be arranged to be supported by the frame 402 when the nasal cannula assembly is fitted to the patient.

[0634] In some examples, at least a portion (e.g., a distal portion) of the at least one nasal prong 406 (e.g., any one or both of the first nasal prong 406a and the second nasal prong 406b) may project (e.g., upwardly and/or posteriorly) from the first longitudinal side wall 441.

Non-modular Features of the Nasal Cannula

[0635] In alternative examples to those describing the nasal prong module above, at least a portion of the features described above with respect to the nasal prong module may be provided as permanent/non-removable features of the nasal cannula.

[0636] For example, the at least one nasal prong may be permanently, fluidly (e.g., pneumatically) and/or mechanically, coupled to the rest (or a portion) of the nasal cannula 400, e.g., any one or both of the frame 402 and coupling member 404. In other words, the at least one nasal prong may be provided as a non-removable feature of the nasal cannula (e.g., not as part of a nasal prong module). The nasal cannula may comprise the at least one gas carrying portion as a non-removable element.

[0637] In some examples, the patient-contacting portion of the nasal cannula, such as the body portion of the nasal prong module (and optionally any one or more of its features described above), and the at least one nasal prong may be provided as a permanent/non-removable feature of the nasal cannula, instead of a removable arrangement e.g., as part of a removable nasal prong module.

[0638] In some examples, the nasal cannula may comprise a cavity. The cavity may comprise or be made of one or more air gaps 470. The cavity (e.g., the one or more air gap 470) may be provided in a patient-contacting portion of the nasal cannula, e.g., the body portion of the nasal prong module. In some examples, the body portion may be arranged such that it defines the cavity (e.g., the one or more air gaps 470). At least a portion of the cavity (e.g., the one or more air gaps 470) may be defined by and/or provided adjacent to any one or more of: at least a portion of a posterior wall (e.g., the posterior wall 444 of the nasal prong module), at least a portion of the first longitudinal side wall 441, at least a portion of first lateral side wall 442 and at least a portion of second lateral side wall 443.

[0639] In some examples, any one or more of the first longitudinal side wall 441 (also referred to as an upper side wall), the first lateral side wall 442 and second lateral side wall 443 may at least in part define the cavity (e.g., one or more air gaps 470). Additionally or alternatively, the one or more air gaps 470 may be at least in part defined by any one or more of: the base portion 420 (of the nasal prong module), a second longitudinal side wall (e.g., opposite the first longitudinal side wall 441) of the body

portion, the at least one gas carrying portions 460, and the at least one nasal prong (e.g., any one or both of the first nasal prong and the second nasal prong).

[0640] The one or more air gaps 470 may be exposed or open to ambient air, e.g., at a lower region of the body portion, in use. In some examples, the one or more air gaps 470 may be open to ambient air via an opening in the second longitudinal side wall. In some examples, the cavity or one or more air gaps 470 may be separated (e.g., fluidly separated) from the at least one gas carrying portion and/or the flow of respiratory gases.

[0641] In some examples, at least a portion of the one or more air gaps 470 may be located centrally of the nasal cannula, e.g., in a central region of the body portion. In some examples, a plurality of cavity zones may be provided. The plurality of air gaps 470 may be at least partially separated by a boundary between each adjacent pair of air gaps 470. The boundary or boundaries between the plurality of air gaps may be formed by and/or positioned at least proximate to the at least one gas carrying portions. In an example, the nasal cannula may comprise three air gaps. A first boundary may be formed by and/or positioned at least proximate to the first gas carrying portion. A second boundary may be formed by and/or positioned at least proximate to the second gas carrying portion. In some examples, the plurality of air gaps may be partially separated and not completely separated from each other.

[0642] In some examples, at least a portion of the cavity or one or more air gaps 470 may be positioned/located between the first gases inlet aperture and the second gases inlet aperture and/or between the first gas carrying portion and the second gas carrying portion. In some examples, at least a portion of the one or more air gaps 470 may be positioned between the at least one gas carrying portion 460 and any one or both of the first lateral side wall 442 and the second lateral side wall 443 and/or the second longitudinal side wall.

[0643] In some examples, at least a portion of the cavity or one or more air gaps 470 (e.g., a first air gap 470a) may be positioned/located between at least a portion of the at least one gas carrying portion (e.g., between the first gas carrying portion 460a and the second gas carrying portion 460b). In other words, the cavity may provide an air gap between the first gas carrying portion 460a and the second gas carrying portion 460b. At least a portion of the one or more air gaps 470 (e.g., a second air gap 470b) may be positioned between at least a portion of the first gas carrying portion 460a and the first lateral side wall 442. Additionally, or alternatively, at least a portion of the one or more air gaps 470 (e.g., a third air gap 470c) may be positioned between at least a portion of the second gas carrying portion 460b and the second lateral side wall 443. An example of the first, second and third air gaps is shown in FIG. 33 and FIG. 34. In

some examples, the second air gap 470b may comprise at least substantially the same size and/or volume as the third air gap 470c. Alternatively, the size and/or volume of second air gap 470b may be bigger or smaller than the third air gap 470c.

[0644] The cavity (e.g., the one or more air gaps 470) of the nasal cannula (e.g., of the nasal prong module) may be positioned and/or provide a space between at least a portion of a posterior wall of a patient-contacting portion of the nasal cannula, such as the posterior wall 444 (e.g., the posterior surface 445a) of the nasal prong module, and the at least one gas carrying portion 460 (e.g., any one or both of the first gas carrying portion 460a and the second gas carrying portion 460b). In some examples, the anterior surface 445b may be exposed to ambient air, e.g., within or via the cavity (e.g., the one or more air gaps 470).

[0645] The cavity (e.g., the one or more air gaps 470) may provide an air insulation gap. The air insulation gap may minimize or at least reduce the amount of heat being transferred from the at least one gas carrying portion 460 to the posterior wall 444 (e.g., the posterior surface 445a). This may avoid or reduce the likelihood of at least a portion of the face/lip contacting surface of the nasal cannula (e.g., the posterior surface 445a) from heating up, which would otherwise in turn potentially heat up the patient's face and/or cause condensation on the patient's face.

[0646] In some examples, the one or more air gaps 470 may provide a cushioning effect for the patient (e.g., lip) contacting surface of the nasal cannula 400. This may provide a more flexible patient (e.g., lip) contacting surface (e.g., posterior wall 444) that may more easily contour to the patient's face (e.g., their upper lip region).

[0647] By providing the one or more air gaps 470, certain areas of the nasal cannula, such as the area between the gas carrying portions 460, at least a portion of the posterior wall 444, at least a portion of the first longitudinal side wall 441, at least a portion of first lateral side wall 442 and at least a portion of second lateral side wall 443, may be more accessible for cleaning and maintenance purposes.

Decoupling Elements

[0648] In some examples, the nasal prong module may comprise one or more decoupling elements. The one or more decoupling elements may be used to remove the nasal prong module from the rest of the nasal cannula 400 (e.g., the frame 402). In some examples, the one or more decoupling elements may be used to urge or cause the nasal prong module to decouple from the frame 402, e.g., by forcibly releasing the one or more coupling structures of the nasal prong module from the one or more attachment structures 490 of the frame 402.

[0649] In some examples, at least a portion of the one or more decoupling elements may be provided on or formed by the at least one lateral extension (e.g., first lateral extension 471 and/or second lateral extension 472). Additionally, or alternatively, at least a portion of any one or more of the posterior wall 444, e.g., the central region 445, and the second longitudinal side wall may each form or provide at least one of the one or more decoupling elements. For example, a portion of the posterior wall 444 and/or the second longitudinal side wall, e.g., adjacent to a portion of the one or more air gaps 470 and/or the opening to ambient air, may provide at least one of the one or more decoupling elements. The one or more decoupling elements may be made of a material that is more flexible and/or stretchable in relation to another portion of the nasal prong module, such as the base portion.

[0650] As mentioned above, any of the abovementioned features of the nasal prong module 408 may also be incorporated/comprised into the arrangement of other possible examples of the nasal prong module described herein, such as any one or more of the nasal prong module 508, the nasal prong module 608 and the nasal prong module 708.

[0651] In some examples, the nasal prong module 508 may comprise a base portion 520, the nasal prong module 608 may comprise a base portion 620 and the nasal prong module 708 may comprise a base portion 720. Any one or more of the base portion 520, base portion 620 and base portion 720 may comprise any of the features of base portion 420 described herein. In some examples, the nasal prong module 508 may comprise a body portion 540, the nasal prong module 608 may comprise a body portion 640 and the nasal prong module 708 may comprise a body portion 740. Any one or more of the body portion 540, body portion 540 and body portion 740 may comprise any of the features of body portion 440 described herein. In some examples, the nasal prong module 508 may comprise a first gas carrying portion 560a and/or a second nasal prong 506b, the nasal prong module 608 may comprise a first gas carrying portion 660a and/or a second gas carrying portion 660b and the nasal prong module 708 may comprise a first gas carrying portion 760a and/or a second gas carrying portion 760b. Any one or more of the first gas carrying portions 560a, 660a, 760a may comprise any of the features of the first gas carrying portion 460a. Any one or more of the second gas carrying portions 560b, 660b, 760b may comprise any of the features of the second gas carrying portion 460b.

Methods for Using the Nasal Prong Module

[0652] Possible examples of methods for configuring the nasal cannula assembly for use in the respiratory support system have been described below. As will be further discussed below, in some examples, the method may comprise selecting and coupling a nasal prong module to the nasal cannula.

[0653] Some examples of the method for configuring the nasal cannula assembly may comprise selecting a nasal prong module. The nasal prong module may be selected from among a plurality of nasal prong modules, e.g., with different nasal prong geometries. As discussed above, the selection may be based on a number of factors, comprising but not limited to patient comfort, type or variant of therapy required and reducing likelihood of obstruction. In some examples the method may comprise removably coupling the selected nasal prong module with the nasal cannula assembly, e.g., with the frame of the nasal cannula assembly.

[0654] In some examples, selecting the nasal prong module may comprise selecting from the plurality of nasal prong modules a first nasal prong module. The method may comprise substituting the first nasal prong module for a second nasal prong module by decoupling the first nasal prong module from the frame and removably coupling the second nasal prong module to the frame.

[0655] The first nasal prong module may comprise a first nasal prong arranged to extend into a left nostril of the patient and form a first left nasal prong, and/or a second nasal prong arranged to extend into a right nostril of the patient and form a first right nasal prong.

[0656] In one example, the first nasal prong geometry is or forms a left asymmetric nasal prong geometry such that, an internal transverse dimension or cross-sectional area of the first left nasal prong is greater than a corresponding internal transverse dimension or cross-sectional area of the first right nasal prong, and/or an external transverse dimension or cross-sectional area of the first left nasal prong is greater than a corresponding external transverse dimension or cross-sectional area of the first right nasal prong. The first left nasal prong may be arranged to provide a greater volumetric flow rate than the first right nasal prong.

[0657] In another example, the first nasal prong geometry may be or form a right asymmetric nasal prong geometry (such as those described above).

[0658] The second nasal prong module may comprise a first nasal prong arranged to extend into a left nostril of the patient and form a second left nasal prong, and a second nasal prong arranged to extend into a right nostril of the patient and form a second right nasal prong.

[0659] In one example, the second nasal prong geometry is or forms a left asymmetric nasal prong geometry such that, an internal transverse dimension or cross-sectional area of the second left nasal prong is greater than a corresponding internal transverse dimension or cross-sectional area of the second right nasal prong, and/or an external transverse dimension or cross-sectional area of the first second nasal prong is greater

than a corresponding external transverse dimension or cross-sectional area of the second right nasal prong. The second left nasal prong may be arranged to provide a greater volumetric flow rate than the second right nasal prong.

[0660] In another example, the second nasal prong geometry may be or form a right asymmetric nasal prong geometry (such as those described above).

[0661] The internal transverse dimension or cross-sectional area of the first left nasal prong may be greater than the internal transverse dimension or cross-sectional area of the second left nasal prong. Additionally or alternatively, the external transverse dimension or cross-sectional area of the first left nasal prong may be greater than the external transverse dimension or cross-sectional area of the second left nasal prong.

[0662] In some examples, the plurality of nasal prong modules may comprise one or more nasal prong modules comprising an asymmetric nasal prong geometry.

[0663] In some examples, the selecting the nasal prong module may comprise selecting between any two or more of:

- a first nasal prong module with a left asymmetric nasal prong geometry,
- a second nasal prong module with a right asymmetric nasal prong geometry,
- a third nasal prong module with a symmetric nasal prong geometry, and/or
- a fourth nasal prong module with a symmetric nasal prong geometry different to that of the third nasal prong module.

[0664] In some examples, the method may comprise selecting a type or variant of therapy for the patient from among a plurality of different types or variants of therapy and selecting the nasal prong module based, at least in part, on the selected type of therapy. The plurality of different types or variants of therapy may comprise asymmetric nasal high flow therapy and/or symmetric nasal high flow therapy. Asymmetric and symmetric nasal high flow therapy, or left asymmetric nasal high flow therapy and right asymmetric nasal high flow therapy may be regarded as different variants of the same type of therapy, i.e., nasal high flow therapy.

[0665] In some examples, the method may comprise selecting between a left side entry or a right side entry for the flow of respiratory gases into the nasal cannula assembly and configuring the nasal cannula assembly for the left side entry or the right side entry. In some examples, selecting between the left side entry and the right side entry may be based, at least in part, on the selected nasal prong module. The selected nasal prong module may comprise a pair of nasal prongs with an asymmetric nasal prong

geometry. The selected nasal prong module may configure the nasal cannula assembly such that a larger one of the pair of nasal prongs may be downstream of a smaller one of the pair of nasal prongs.

[0666] In some examples, selecting between the left side entry and the right side entry may comprise selecting the left side entry if the selected nasal prong module comprises a right asymmetric nasal prong geometry and/or selecting the right side entry if the selected nasal prong module comprises a left asymmetric nasal prong geometry. Alternatively or additionally, the method may comprise selecting either of the left side entry or the right side entry if the selected nasal prong module comprises a symmetric nasal prong geometry.

[0667] In some examples, the method may comprise removing an existing nasal prong module from the nasal cannula assembly, e.g., from the frame of the nasal cannula assembly. The selected nasal prong module may comprise a different nasal prong geometry compared to the existing nasal prong module. The selected nasal prong module may provide a different type or variant of therapy compared to the existing nasal prong module. Alternatively, the selected nasal prong module may comprise the same nasal prong geometry compared to the existing nasal prong module.

[0668] Possible examples of methods for reconfiguring a respiratory support system, or a nasal cannula assembly for use in the respiratory support system, e.g., to provide a different type or variant of therapy to the patient, have been described below.

[0669] In some examples, the method may comprise removing a first nasal prong module (e.g., comprising a first nasal prong geometry) from the nasal cannula assembly, e.g., the frame of the nasal cannula assembly. The method may comprise removably coupling a second nasal prong module (e.g., comprising a second nasal prong geometry that is different to the first nasal prong geometry) with the nasal cannula assembly, e.g., with the frame of the nasal cannula assembly.

[0670] The first nasal prong geometry may comprise one of a symmetric nasal prong geometry and an asymmetric nasal prong geometry. The second nasal prong geometry may comprise the other of the symmetric nasal prong geometry and the asymmetric nasal prong geometry. The first nasal prong module may be arranged to provide one of a symmetric nasal high flow therapy and an asymmetric nasal high flow therapy. The second nasal prong modules may be arranged to provide the other of the symmetric nasal high flow therapy and the asymmetric nasal high flow therapy.

[0671] In some examples, first nasal prong geometry may comprise one of a left asymmetric nasal prong geometry and a right asymmetric nasal prong geometry. The second nasal prong geometry may comprise the other of the left asymmetric nasal prong

geometry and the right asymmetric nasal prong geometry. The first nasal prong module and the second nasal prong module may both provide an asymmetric nasal high flow therapy. The asymmetric nasal high flow therapy of the first nasal prong module and the second nasal prong module may be different to each other.

[0672] In some examples, the reconfiguring respiratory support system or nasal cannula system may comprise any one or more of reconfiguring:

- from a symmetric high flow respiratory support system or a symmetric high flow nasal cannula assembly arranged to provide symmetric nasal high flow therapy, to an asymmetric high flow respiratory support system or an asymmetric high flow nasal cannula assembly arranged to provide asymmetric nasal high flow therapy;
- from an asymmetric high flow respiratory support system or an asymmetric high flow nasal cannula assembly arranged to provide asymmetric nasal high flow therapy, to a symmetric high flow respiratory support system or a symmetric high flow nasal cannula assembly arranged to provide symmetric nasal high flow therapy;
- from a first asymmetric high flow respiratory support system or a first asymmetric high flow nasal cannula assembly arranged to provide a first asymmetric nasal high flow therapy, to a second asymmetric high flow respiratory support system or a second asymmetric high flow nasal cannula assembly arranged to provide a second asymmetric nasal high flow therapy that is different to the first asymmetric nasal high flow therapy.

[0673] In some examples, the methods mentioned above may not require for any settings of the gases source 110 to be changed in order to reconfigure the respiratory support system or the nasal cannula assembly to provide a different type or variant of therapy.

[0674] In some examples, the methods described above may comprise reusing the frame and any one or more of:

- the coupling member of the nasal cannula assembly, the coupling member may be arranged to be coupled with the frame;
- the at least one inlet conduit of the nasal cannula assembly, the at least one inlet conduit may be arranged to be coupled with the coupling member;
- at least one coupling member connector of the nasal cannula assembly, the coupling member connector may be arranged to couple the at least one inlet conduit with the coupling member;

- at least one the swivel connector of the nasal cannula assembly, the swivel connector may be arranged to couple the at least one inlet conduit with an inspiratory conduit of the respiratory support; and
- the headgear of the nasal cannula assembly, the headgear may be arranged to be removably and/or adjustably coupled with the frame and to extend around a rear of a head of the patient to secure the frame in position on the head.

LISTING OF DRAWING ELEMENTS

100 respiratory support system
 110 gases source
 112 gases source outlet
 114 filter
 120 humidifier supply conduit
 130 humidifier
 132 humidifier base
 134 humidification chamber
 140 inspiratory conduit
 142 connector
 144 connector
 146 tubing
 150 nasal cannula assembly
 200 respiratory support system
 210 respiratory support apparatus
 302 inlet conduit
 304 nasal cannula
 306 headgear
 308 connector
 310 connector
 312 tubing
 400 nasal cannula
 402 frame
 404 coupling member
 405 coupling member connector
 406 nasal prong
 406a first nasal prong
 406b second nasal prong
 407 side arm
 407a first side arm
 407b second side arm

408 nasal prong module
409 headgear connecting portion
409a first headgear connecting portion
409b second headgear connecting portion
410 tubing clip
411 mounting portion
411a first mounting portion
411b second mounting portion
412 pin
420 base portion
421 first longitudinal side
422 second longitudinal side
430 recess
440 body portion
450 gases inlet aperture
450a first gases inlet aperture
450b second gases inlet aperture
451 gas outlet
451a first gas outlet
451b second gas outlet
460 gas carrying portion
460a first gas carrying portion
460b second gas carrying portion
414 outlet opening
414a first outlet opening
414b second outlet opening
423 tongue
424 groove
431 common axis
432 securing member
433 receiving portion
434 blocking portion
435 barrier portion
436 main body
437 extension
438 dipped region
439 central portion
441 first longitudinal side wall
442 first lateral side wall
443 second lateral side wall

444 posterior wall
445 central region
445a posterior surface
445b anterior surface
446 conduit fastener
448 connection protrusion
449 connection aperture
460a first gas carrying portion
460b second gas carrying portion
461 inlet opening
461a first inlet opening
461b second inlet opening
470 air gap
470a first air gap
470b second air gap
470c third air gap
471 first lateral extension
472 second lateral extension
480 coupling structure
481 slot
483 pivot portion
490 attachment structure
491 protrusion
506 nasal prong
506a first nasal prong
506b second nasal prong
508 nasal prong module
520 base portion
540 body portion
560a first gas carrying portion
560b second gas carrying portion
606 nasal prong
606a first nasal prong
606b second nasal prong
608 nasal prong module
620 base portion
640 body portion
660a first gas carrying portion
660b second gas carrying portion
706 nasal prong

706a first nasal prong
707b second nasal prong
708 nasal prong module
760a first gas carrying portion
760b second gas carrying portion
720 base portion
740 body portion
4071a first connecting region
4071b second connecting region
4072a first pivoting or flexing axis
4072b second pivoting or flexing axis
4111 body
4112 attachment portion
4113 securing portion
4114 alignment portion
C coronal plane
S sagittal plane

CLAIMS

What is claimed is:

1. A nasal cannula system for use in a respiratory support system (100, 200) arranged to deliver a flow of respiratory gases to an upper airway of a patient, the nasal cannula system comprising:

a frame (402);

a first nasal prong module (408, 508 608, 708) comprising a first nasal prong geometry; and

a second nasal prong module (408, 508 608, 708) comprising a second nasal prong geometry different to the first nasal prong geometry,

wherein the frame (402) is arranged to be selectively removably coupled to any one of the first nasal prong module (408 508 608, 708) and the second nasal prong module (408, 508 608, 708).

2. The nasal cannula system of claim 1, wherein:

the first nasal prong module (408, 508 608, 708) comprises any one or both of:

a first nasal prong (406a, 506a, 606a, 706a) arranged to form a first left nasal prong (406a, 506a, 606a, 706a); and

a second nasal prong (406b, 506b, 606b, 706b) arranged to form a first right nasal prong (406b, 506b, 606b, 706b), and

the second nasal prong module (408, 508 608, 708) comprises any one or both of:

a first nasal prong (406a, 506a, 606a, 706a) arranged to form a second left nasal prong (406a, 506a, 606a, 706a); and

a second nasal prong (406b, 506b, 606b, 706b) arranged to form a second right nasal prong (406b, 506b, 606b, 706b).

3. The nasal cannula system of claim 2, wherein:

the first nasal prong (406a, 506a, 606a, 706a) of the first nasal prong module (408, 508 608, 708) and the second nasal prong module (408, 508 608, 708) are arranged to extend into a left nostril of the patient; and

the second nasal prong (406b, 506b, 606b, 706b) of the first nasal prong module (408, 508 608, 708) and the second nasal prong module (408, 508 608, 708) are arranged to extend into a right nostril of the patient.

4. The nasal cannula system of claim 2 or 3, wherein:

the first nasal prong module (408, 508 608, 708) comprises the first left nasal prong (406a, 506a, 606a, 706a) and the first right nasal prong (406b, 506b, 606b, 706b); and

the second nasal prong module (408, 508 608, 708) comprises the second left nasal prong (406a, 506a, 606a, 706a) and the second right nasal prong (406b, 506b, 606b, 706b).

5. The nasal cannula system of claim 4, wherein the first nasal prong geometry is or forms an asymmetric nasal prong geometry, such that:

an internal transverse dimension or cross-sectional area of the first left nasal prong (406a, 506a, 606a, 706a) is different to a corresponding internal transverse dimension or cross-sectional area of the first right nasal prong (406b, 506b, 606b, 706b); and/or

an external transverse dimension or cross-sectional area of the first left nasal prong (406a, 506a, 606a, 706a) is different to a corresponding external transverse dimension or cross-sectional area of the first right nasal prong (406b, 506b, 606b, 706b).

6. The nasal cannula system of claim 4 or 5, wherein the first nasal prong geometry is or forms a left asymmetric nasal prong geometry such that:

an internal transverse dimension or cross-sectional area of the first left nasal prong (406a, 506a, 606a, 706a) is greater than a corresponding internal transverse dimension or cross-sectional area of the first right nasal prong (406b, 506b, 606b, 706b); and/or

an external transverse dimension or cross-sectional area of the first left nasal prong (406a, 506a, 606a, 706a) is greater than a corresponding external transverse dimension or cross-sectional area of the first right nasal prong (406b, 506b, 606b, 706b),

wherein optionally the first left nasal prong (406a, 506a, 606a, 706a) is arranged to provide a greater volumetric flow rate than the first right nasal prong (406b, 506b, 606b, 706b).

7. The nasal cannula system of claim 4 or 5, wherein the first nasal prong geometry is or forms a right asymmetric nasal prong geometry such that:

an internal transverse dimension or cross-sectional area of the first right nasal prong (406b, 506b, 606b, 706b) is greater than a corresponding internal transverse dimension or cross-sectional area of the first left nasal prong (406a, 506a, 606a, 706a); and/or

an external transverse dimension or cross-sectional area of the first right nasal prong (406b, 506b, 606b, 706b) is greater than a corresponding external transverse dimension or cross-sectional area of the first left nasal prong (406a, 506a, 606a, 706a),

wherein optionally the first right nasal prong (406b, 506b, 606b, 706b) is arranged to provide a greater volumetric flow rate than the first left nasal prong (406a, 506a, 606a, 706a).

8. The nasal cannula system of any one of claims 4 to 7, wherein the second nasal prong geometry is or forms an asymmetric nasal prong geometry, such that:

an internal transverse dimension or cross-sectional area of the second left nasal prong (406a, 506a, 606a, 706a) is different to a corresponding internal transverse dimension or cross-sectional area of the second right nasal prong (406b, 506b, 606b, 706b); and/or

an external transverse dimension or cross-sectional area of the second left nasal prong (406a, 506a, 606a, 706a) is different to a corresponding external transverse dimension or cross-sectional area of the second right nasal prong (406b, 506b, 606b, 706b).

9. The nasal cannula system of any one of claims 4 to 8, wherein the second nasal prong geometry is or forms a left asymmetric nasal prong geometry such that:

an internal transverse dimension or cross-sectional area of the second left nasal prong (406a, 506a, 606a, 706a) is greater than a corresponding internal transverse dimension or cross-sectional area of the second right nasal prong (406b, 506b, 606b, 706b); and/or

an external transverse dimension or cross-sectional area of the second left nasal prong (406a, 506a, 606a, 706a) is greater than a corresponding external transverse dimension or cross-sectional area of the second right nasal prong (406b, 506b, 606b, 706b),

wherein optionally the second left nasal prong (406a, 506a, 606a, 706a) is arranged to provide a greater volumetric flow rate than the second right nasal prong (406b, 506b, 606b, 706b).

10. The nasal cannula system of any one of claims 4 to 8, wherein the second nasal prong geometry is or forms a right asymmetric nasal prong geometry such that:

an internal transverse dimension or cross-sectional area of the second right nasal prong (406b, 506b, 606b, 706b) is greater than a corresponding internal transverse dimension or cross-sectional area of the second left nasal prong (406a, 506a, 606a, 706a); and/or

an external transverse dimension or cross-sectional area of the second right nasal prong (406b, 506b, 606b, 706b) is greater than a corresponding external transverse dimension or cross-sectional area of the second left nasal prong (406a, 506a, 606a, 706a),

wherein optionally the second right nasal prong (406b, 506b, 606b, 706b) is arranged to provide a greater volumetric flow rate than the second left nasal prong (406a, 506a, 606a, 706a).

11. The nasal cannula system of claim 9 when dependent from claim 6, wherein:

the internal transverse dimension or cross-sectional area of the first left nasal prong (406a, 506a, 606a, 706a) is greater than the internal transverse dimension or cross-sectional area of the second left nasal prong (406a, 506a, 606a, 706a); and/or

the external transverse dimension or cross-sectional area of the first left nasal prong (406a, 506a, 606a, 706a) is greater than the external transverse dimension or cross-sectional area of the second left nasal prong (406a, 506a, 606a, 706a).

12. The nasal cannula system of claim 11, wherein:

the internal transverse dimension or cross-sectional area of the first right nasal prong (406b, 506b, 606b, 706b) is greater than the internal transverse dimension or cross-sectional area of the second right nasal prong (406b, 506b, 606b, 706b); and/or

the external transverse dimension or cross-sectional area of the first right nasal prong (406b, 506b, 606b, 706b) is greater than the external transverse dimension or cross-sectional area of the second right nasal prong (406b, 506b, 606b, 706b).

13. The nasal cannula system of claim 10 when dependent from claim 7, wherein:

the internal transverse dimension or cross-sectional area of the first right nasal prong (406b, 506b, 606b, 706b) is greater than the internal transverse dimension or cross-sectional area of the second right nasal prong (406b, 506b, 606b, 706b); and/or

the external transverse dimension or cross-sectional area of the first right nasal prong (406b, 506b, 606b, 706b) is greater than the external transverse dimension or cross-sectional area of the second right nasal prong (406b, 506b, 606b, 706b).

14. The nasal cannula system of claim 13, wherein:

the internal transverse dimension or cross-sectional area of the first left nasal prong (406a, 506a, 606a, 706a) is greater than the internal transverse dimension or cross-sectional area of the second left nasal prong (406a, 506a, 606a, 706a); and/or

the external transverse dimension or cross-sectional area of the first left nasal prong (406a, 506a, 606a, 706a) is greater than the external transverse dimension or cross-sectional area of the second left nasal prong (406a, 506a, 606a, 706a).

15. The nasal cannula system of claim 1, wherein the first nasal prong geometry is or forms a mirror-image of the second nasal prong geometry.

16. The nasal cannula system of claim 4, wherein any one or both of the first nasal prong geometry and the second nasal prong geometry is or forms a symmetric nasal prong geometry, such that:

the first left nasal prong (406a, 506a, 606a, 706a) is or forms a mirror-image of the first right nasal prong (406b, 506b, 606b, 706b); and/or

the second left nasal prong (406a, 506a, 606a, 706a) is or forms a mirror-image of the second right nasal prong (406b, 506b, 606b, 706b).

17. The nasal cannula system of claim 4, wherein the first nasal prong geometry is or forms an asymmetric nasal prong geometry such that:

an internal transverse dimension or cross-sectional area of the first left nasal prong (406a, 506a, 606a, 706a) is different to a corresponding internal transverse dimension or cross-sectional area of the first right nasal prong (406b, 506b, 606b, 706b); and/or

an external transverse dimension or cross-sectional area of the first left nasal prong (406a, 506a, 606a, 706a) is different to a corresponding external transverse dimension or cross-sectional area of the first right nasal prong (406b, 506b, 606b, 706b), and

the second nasal prong geometry is or forms a symmetric nasal prong geometry such that the second left nasal prong (406a, 506a, 606a, 706a) is or forms a mirror-image of the second right nasal prong (406b, 506b, 606b, 706b).

18. The nasal cannula system of any one of claims 1 to 16, comprising a third nasal prong module (408, 508, 608, 708) comprising a third nasal prong geometry, wherein the third nasal prong geometry is different from the first nasal prong geometry and the second nasal prong geometry, wherein the frame (402) is arranged to be selectively removably coupled to any one of the first nasal prong module (408, 508, 608, 708), the second nasal prong module (408, 508, 608, 708), and the third nasal prong module (408, 508, 608, 708).

19. The nasal cannula system of claim 18, wherein the third nasal prong module (408, 508, 608, 708) comprises any one or both of:

a first nasal prong (406a, 506a, 606a, 706a) arranged to form a third left nasal prong (406a, 506a, 606a, 706a); and

a second nasal prong (406b, 506b, 606b, 706b) arranged to form a third right nasal prong (406b, 506b, 606b, 706b).

20. The nasal cannula system of claim 19, wherein:

the first nasal prong (406a, 506a, 606a, 706a) of the third nasal prong module (408, 508, 608, 708) is arranged to extend into a/the left nostril of the patient; and

the second nasal prong (406b, 506b, 606b, 706b) of the third nasal prong module (408, 508, 608, 708) is arranged to extend into a/the right nostril of the patient.

21. The nasal cannula system of claim 19 or 20 when dependent from claim 4, wherein:

the first nasal prong geometry is or forms a left asymmetric nasal prong geometry such that:

an internal transverse dimension or cross-sectional area of the first left nasal prong (406a, 506a, 606a, 706a) is greater than a corresponding internal transverse dimension or cross-sectional area of the first right nasal prong (406b, 506b, 606b, 706b); and/or

an external transverse dimension or cross-sectional area of the first left nasal prong (406a, 506a, 606a, 706a) is greater than a corresponding external transverse dimension or cross-sectional area of the first right nasal prong (406b, 506b, 606b, 706b),

wherein optionally the first left nasal prong (406a, 506a, 606a, 706a) is arranged to provide a greater volumetric flow rate than the first right nasal prong (406b, 506b, 606b, 706b);

the second nasal prong geometry is or forms a left asymmetric nasal prong geometry such that:

an internal transverse dimension or cross-sectional area of the second left nasal prong (406a, 506a, 606a, 706a) is greater than a corresponding internal transverse dimension or cross-sectional area of the second right nasal prong (406b, 506b, 606b, 706b); and/or

an external transverse dimension or cross-sectional area of the second left nasal prong (406a, 506a, 606a, 706a) is greater than a corresponding external transverse dimension or cross-sectional area of the second right nasal prong (406b, 506b, 606b, 706b),

wherein optionally the second left nasal prong (406a, 506a, 606a, 706a) is arranged to provide a greater volumetric flow rate than the second right nasal prong (406b, 506b, 606b, 706b);

the third nasal prong geometry is or forms a left asymmetric nasal prong geometry such that:

an internal transverse dimension or cross-sectional area of the third left nasal prong (406a, 506a, 606a, 706a) is greater than a corresponding internal transverse dimension or cross-sectional area of the third right nasal prong (406b, 506b, 606b, 706b); and/or

an external transverse dimension or cross-sectional area of the third left nasal prong (406a, 506a, 606a, 706a) is greater than a corresponding external transverse dimension or cross-sectional area of the third right nasal prong (406b, 506b, 606b, 706b),

wherein optionally the third left nasal prong (406a, 506a, 606a, 706a) is arranged to provide a greater volumetric flow rate than the third right nasal prong (406b, 506b, 606b, 706b).

22. The nasal cannula system of claim 19 or 20 when dependent from claim 4, wherein:

the first nasal prong geometry is or forms a right asymmetric nasal prong geometry such that:

an internal transverse dimension or cross-sectional area of the first right nasal prong (406b, 506b, 606b, 706b) is greater than a corresponding internal transverse dimension or cross-sectional area of the first left nasal prong (406a, 506a, 606a, 706a); and/or

an external transverse dimension or cross-sectional area of the first right nasal prong (406b, 506b, 606b, 706b) is greater than a corresponding external transverse dimension or cross-sectional area of the first left nasal prong (406a, 506a, 606a, 706a),

wherein optionally the first right nasal prong (406b, 506b, 606b, 706b) is arranged to provide a greater volumetric flow rate than the first left nasal prong (406a, 506a, 606a, 706a);

the second nasal prong geometry is or forms a right asymmetric nasal prong geometry such that:

an internal transverse dimension or cross-sectional area of the second right nasal prong (406b, 506b, 606b, 706b) is greater than a corresponding internal transverse dimension or cross-sectional area of the second left nasal prong (406a, 506a, 606a, 706a); and/or

an external transverse dimension or cross-sectional area of the second right nasal prong (406b, 506b, 606b, 706b) is greater than a corresponding external transverse dimension or cross-sectional area of the second left nasal prong (406a, 506a, 606a, 706a),

wherein optionally the second right nasal prong (406b, 506b, 606b, 706b) is arranged to provide a greater volumetric flow rate than the second left nasal prong (406a, 506a, 606a, 706a);

the third nasal prong geometry is or forms a right asymmetric nasal prong geometry such that:

an internal transverse dimension or cross-sectional area of the third right nasal prong (406b, 506b, 606b, 706b) is greater than a corresponding internal transverse dimension or cross-sectional area of the third left nasal prong (406a, 506a, 606a, 706a); and/or

an external transverse dimension or cross-sectional area of the third right nasal prong (406b, 506b, 606b, 706b) is greater than a corresponding external transverse dimension or cross-sectional area of the third left nasal prong (406a, 506a, 606a, 706a),

wherein optionally the third right nasal prong (406b, 506b, 606b, 706b) is arranged to provide a greater volumetric flow rate than the third left nasal prong (406a, 506a, 606a, 706a).

23. The nasal cannula system of claim 21 or 22, wherein:

the internal transverse dimension or cross-sectional area of the first left nasal prong (406a, 506a, 606a, 706a) is greater than the internal transverse dimension or cross-sectional area of the second left nasal prong (406a, 506a, 606a, 706a) and/or the external transverse dimension or cross-sectional area of the first left nasal prong (406a, 506a, 606a, 706a) is greater than the external transverse dimension or cross-sectional area of the second left nasal prong (406a, 506a, 606a, 706a); and

the internal transverse dimension or cross-sectional area of the second left nasal prong (406a, 506a, 606a, 706a) is greater than the internal transverse dimension or cross-sectional area of the third left nasal prong (406a, 506a, 606a, 706a); and/or the external transverse dimension or cross-sectional area of the second left nasal prong (406a, 506a, 606a, 706a) is greater than the external transverse dimension or cross-sectional area of the third left nasal prong (406a, 506a, 606a, 706a).

24. The nasal cannula system of any one of claims 21 to 23, wherein:

the internal transverse dimension or cross-sectional area of the first right nasal prong (406b, 506b, 606b, 706b) is greater than the internal transverse dimension or cross-sectional area of the second right nasal prong (406b, 506b, 606b, 706b) and/or the external transverse dimension or cross-sectional area of the first right nasal prong (406b, 506b, 606b, 706b) is greater than the external transverse dimension or cross-sectional area of the second right nasal prong (406b, 506b, 606b, 706b); and

the internal transverse dimension or cross-sectional area of the second right nasal prong (406b, 506b, 606b, 706b) is greater than the internal transverse dimension or cross-sectional area of the third right nasal prong (406b, 506b, 606b, 706b); and/or the external transverse dimension or cross-sectional area of the second right nasal prong (406b, 506b, 606b, 706b) is greater than the external transverse dimension or cross-sectional area of the third right nasal prong (406b, 506b, 606b, 706b).

25. The nasal cannula system of claim 19 or 20 when dependent from claim 4, wherein:

the first nasal prong geometry is or forms a left asymmetric nasal prong geometry such that:

an internal transverse dimension or cross-sectional area of the first left nasal prong (406a, 506a, 606a, 706a) is greater than a corresponding internal transverse dimension or cross-sectional area of the first right nasal prong (406b, 506b, 606b, 706b); and/or

an external transverse dimension or cross-sectional area of the first left nasal prong (406a, 506a, 606a, 706a) is greater than a corresponding external transverse dimension or cross-sectional area of the first right nasal prong (406b, 506b, 606b, 706b),

wherein optionally the first left nasal prong (406a, 506a, 606a, 706a) is arranged to provide a greater volumetric flow rate than the first right nasal prong (406b, 506b, 606b, 706b)

the second nasal prong geometry is or forms a right asymmetric nasal prong geometry such that:

an internal transverse dimension or cross-sectional area of the second right nasal prong (406b, 506b, 606b, 706b) is greater than a corresponding internal transverse dimension or cross-sectional area of the second left nasal prong (406a, 506a, 606a, 706a); and/or

an external transverse dimension or cross-sectional area of the second right nasal prong (406b, 506b, 606b, 706b) is greater than a corresponding external transverse dimension or cross-sectional area of the second left nasal prong (406a, 506a, 606a, 706a),

wherein optionally the second right nasal prong (406b, 506b, 606b, 706b) is arranged to provide a greater volumetric flow rate than the second left nasal prong (406a, 506a, 606a, 706a)

the third nasal prong geometry comprises the third left nasal prong (406a, 506a, 606a, 706a) and the third right nasal prong (406b, 506b, 606b, 706b), and the third nasal prong geometry is or forms a symmetric nasal prong geometry such that the third left nasal prong (406a, 506a, 606a, 706a) is or forms a mirror-image of the third right nasal prong (406b, 506b, 606b, 706b),

wherein optionally the third left nasal prong (406a, 506a, 606a, 706a) and third right nasal prong (406b, 506b, 606b, 706b) are arranged to provide substantially the same volumetric flow rate.

26. The nasal cannula system of any one of claims 18 to 25, comprising a fourth nasal prong module (408, 508, 608, 708) having a fourth nasal prong geometry, wherein the fourth nasal prong geometry is different from the first nasal prong geometry, the second nasal prong geometry, and the third nasal prong geometry, wherein the frame (402) is arranged to be selectively removably coupled to any one of the first nasal prong module (408, 508, 608, 708), the second nasal prong module (408, 508, 608, 708), the third nasal prong module (408, 508, 608, 708), and the fourth nasal prong module (408, 508, 608, 708).

27. The nasal cannula system of claim 26 wherein the fourth nasal prong module (408, 508, 608, 708) comprises any one or both of:

a first nasal prong (406a, 506a, 606a, 706a) arranged to form a fourth left nasal prong (406a, 506a, 606a, 706a); and

a second nasal prong (406b, 506b, 606b, 706b) arranged to form a fourth right nasal prong (406b, 506b, 606b, 706b).

28. The nasal cannula system of claim 27, wherein:

the first nasal prong (406a, 506a, 606a, 706a) of the fourth nasal prong module (408, 508, 608, 708) is arranged to extend into the left nostril of the patient; and

the second nasal prong (406b, 506b, 606b, 706b) of the fourth nasal prong module (408, 508, 608, 708) is arranged to extend into the right nostril of the patient.

29. The nasal cannula system of claim 27 when dependent from claim 25, wherein the fourth nasal prong geometry is or forms a symmetric nasal prong geometry in that the fourth left nasal prong (406a, 506a, 606a, 706a) is a mirror-image of the fourth right nasal prong (406b, 506b, 606b, 706b).

30. The nasal cannula system of claim 29, wherein:

an internal transverse dimension or cross-sectional area of the third left nasal prong and the third right nasal prong is different from a corresponding internal transverse dimension or cross-sectional area of the fourth left nasal prong and fourth right nasal prong, respectively; and/or

an external transverse dimension or cross-sectional area of the third left nasal prong and the third right nasal prong is different from a corresponding external transverse dimension or cross-sectional area of the fourth left nasal prong and fourth right nasal prong, respectively.

31. The nasal cannula system of any one of claims 1 to 30, wherein the first nasal prong module (408, 508, 608, 708) is arranged to interact with the flow of respiratory gases received by the first nasal prong module (408, 508, 608, 708) to provide a first nasal high flow therapy to the patient, and the second nasal prong module (408, 508, 608, 708) is arranged to interact with the flow of respiratory gases received by the second nasal prong module (408, 508, 608, 708) to provide a second nasal high flow therapy to the patient, wherein the second nasal high flow therapy is different to the first nasal high flow therapy.

32. The nasal cannula system of claim 31, wherein provision of the first nasal high flow therapy or the second nasal high flow therapy by the respiratory support system (100, 200) is at least partly determined by selection and coupling of the first nasal prong module (408, 508, 608, 708) or the second nasal prong module (408, 508, 608, 708) with the frame (402), optionally without the need for a change to any other configuration and/or setting of the respiratory support system (100, 200).

33. The nasal cannula system of claim 31 or 32, wherein:

the first nasal high flow therapy is one of an asymmetric nasal high flow therapy or a symmetric nasal high flow therapy; and

the second nasal high flow therapy is the other of the asymmetric nasal high flow therapy or the symmetric nasal high flow therapy.

34. The nasal cannula system of claim 31 or 32, wherein:

the first nasal high flow therapy is a left asymmetric nasal high flow therapy; and

the second nasal high flow therapy is a right asymmetric nasal high flow therapy.

35. The nasal cannula system of any one of claims 1 to 34, wherein any one or both of the first nasal prong module (408, 508, 608, 708) and the second nasal prong module (408, 508, 608, 708) is arranged to partially occlude at least one of the left nostril and the right nostril of the patient.

36. The nasal cannula system of any one of claims 1 to 35, the first nasal prong module (408, 508, 608, 708) comprising a first color scheme associated with the first nasal prong geometry, the second nasal prong module (408, 508, 608, 708) comprising a second color scheme associated with the second nasal prong geometry, wherein the second color scheme is different to the first color scheme.

37. The nasal cannula system of claim 36, wherein the first nasal prong geometry forms:

an asymmetric nasal prong geometry, the first color scheme comprising two colors, wherein the two colors of the first color scheme are associated with a geometry of the first left nasal prong (406a, 506a, 606a, 706a) and the first right nasal prong (406b, 506b, 606b, 706b), respectively; or

a symmetric nasal prong geometry, the first color scheme comprising a single color, wherein the single color of the first color scheme is associated with a geometry of the first left nasal prong (406a, 506a, 606a, 706a) and the first right nasal prong (406b, 506b, 606b, 706b).

38. The nasal cannula system of claim 36 or 37, wherein the second nasal prong geometry forms:

an asymmetric nasal prong geometry, the second color scheme comprising two colors, wherein the two colors of the second color scheme are associated with a geometry of the second left nasal prong (406a, 506a, 606a, 706a) and the second right nasal prong (406b, 506b, 606b, 706b), respectively; or

a symmetric nasal prong geometry, the second color scheme comprising a single color, wherein the single color of the second color scheme is associated with a geometry of the second left nasal prong (406a, 506a, 606a, 706a) and the second right nasal prong (406b, 506b, 606b, 706b).

39. The nasal cannula system of claim 18 or any one of claims 19 to 38 when dependent from claim 18, wherein:

the first nasal prong module (408, 508, 608, 708) comprises a first color scheme associated with the first nasal prong geometry,

the second nasal prong module (408, 508, 608, 708) comprises a second color scheme associated with the second nasal prong geometry;

the third nasal prong module (408, 508, 608, 708) comprises a third color scheme associated with the third nasal prong geometry; and

the first color scheme, the second color scheme and the third color scheme are different from each other.

40. The nasal cannula system of claim 39, wherein the third nasal prong geometry is or forms:

an asymmetric nasal prong geometry, the third color scheme comprising two colors, wherein the two colors of the third color scheme are associated with a geometry

of the third left nasal prong (406a, 506a, 606a, 706a) and the third right nasal prong (406b, 506b, 606b, 706b), respectively; or

a symmetric nasal prong geometry, the third color scheme comprising a single color, wherein the single color of the third color scheme is associated with a geometry of the third left nasal prong (406a, 506a, 606a, 706a) and the third right nasal prong (406b, 506b, 606b, 706b).

41. The nasal cannula system of claim 26 or any one of claims 27 to 40 when dependent from claim 26, wherein:

the first nasal prong module (408, 508, 608, 708) comprises a first color scheme associated with the first nasal prong geometry,

the second nasal prong module (408, 508, 608, 708) comprises a second color scheme associated with the second nasal prong geometry;

the third nasal prong module (408, 508, 608, 708) comprises a third color scheme associated with the third nasal prong geometry;

the fourth nasal prong module (408, 508, 608, 708) comprises a fourth color scheme associated with the fourth nasal prong geometry; and

the first color scheme, the second color scheme, the third color scheme and the fourth color scheme are different from each other.

42. The nasal cannula system of claim 41, wherein the fourth nasal prong geometry forms:

an asymmetric nasal prong geometry, the fourth color scheme comprising two colors, wherein the two colors of the fourth color scheme is associated with a geometry of the fourth left nasal prong (406a, 506a, 606a, 706a) and the fourth right nasal prong (406b, 506b, 606b, 706b), respectively; or

a symmetric nasal prong geometry, the fourth color scheme comprising a single color, wherein the single color of the fourth color scheme is associated with a geometry of the fourth left nasal prong (406a, 506a, 606a, 706a) and the fourth right nasal prong (406b, 506b, 606b, 706b).

43. A nasal cannula system for use in a respiratory support system (100, 200) arranged to deliver a flow of respiratory gases to an upper airway of a patient, the nasal cannula system comprising:

a frame (402);

a first nasal prong module (408, 508, 608, 708) comprising a first nasal prong geometry; and

a second nasal prong module (408, 508, 608, 708) comprising a second nasal prong geometry,

wherein:

the frame (402) is arranged to be selectively coupled to any one of the first nasal prong module (408, 508, 608, 708) and the second nasal module (408, 508, 608, 708); and

the first nasal prong geometry and the second nasal prong geometry are at least substantially the same or identical.

44. The nasal cannula system of claim 43, wherein:

the first nasal prong module (408, 508, 608, 708) comprises any one or both of:

a first nasal prong (406a, 506a, 606a, 706a) arranged to form a first left nasal prong (406a, 506a, 606a, 706a); and

a second nasal prong (406b, 506b, 606b, 706b) arranged to form a first right nasal prong (406b, 506b, 606b, 706b), and

the second nasal prong module (408, 508, 608, 708) comprises any one or both of:

a first nasal prong (406a, 506a, 606a, 706a) arranged to form a second left nasal prong (406a, 506a, 606a, 706a); and

a second nasal prong (406b, 506b, 606b, 706b) arranged to form a second right nasal prong (406b, 506b, 606b, 706b).

45. The nasal cannula system of claim 44, wherein:

the first nasal prong (406a, 506a, 606a, 706a) of each of the first nasal prong module (408, 508, 608, 708) and the second nasal prong module (408, 508, 608, 708) are arranged to extend into a left nostril of the patient; and

the second nasal prong (406b, 506b, 606b, 706b) of each of the first nasal prong module (408, 508, 608, 708) and the second nasal prong module (408, 508, 608, 708) are arranged to extend into a right nostril of the patient.

46. The nasal cannula system of claim 44 or 45, wherein:

the first nasal prong module (408, 508, 608, 708) comprises the first left nasal prong (406a, 506a, 606a, 706a) and the first right nasal prong (406b, 506b, 606b, 706b); and

the second nasal prong module (408, 508, 608, 708) comprises the second left nasal prong (406a, 506a, 606a, 706a) and the second right nasal prong (406b, 506b, 606b, 706b).

47. The nasal cannula system of claim 46, wherein both of the first nasal prong geometry and the second nasal prong geometry are or form an asymmetric nasal prong geometry, such that:

an internal transverse dimension or cross-sectional area of the first left nasal prong (406a, 506a, 606a, 706a) and second left nasal prong (406a, 506a, 606a, 706a) are different to a corresponding internal transverse dimension or cross-sectional area of the first right nasal prong (406b, 506b, 606b, 706b) and second right nasal prong (406b, 506b, 606b, 706b), respectively; and/or

an external transverse dimension or cross-sectional area of the first left nasal prong (406a, 506a, 606a, 706a) and second left nasal prong (406a, 506a, 606a, 706a) are different to a corresponding external transverse dimension or cross-sectional area of the first right nasal prong (406b, 506b, 606b, 706b) and second right nasal prong (406b, 506b, 606b, 706b), respectively,

wherein:

the first left nasal prong (406a, 506a, 606a, 706a) and the second left nasal prong (406a, 506a, 606a, 706a) comprise the same or substantially the same internal transverse dimension or cross-sectional area and external transverse dimension or cross-sectional area; and/or

the first right nasal prong (406b, 506b, 606b, 706b) and the second right nasal prong (406b, 506b, 606b, 706b) comprise the same or substantially the same internal transverse dimension or cross-sectional area and external transverse dimension or cross-sectional area.

48. The nasal cannula system of any one of claims 1 to 47, comprising a coupling member (404) for receiving the flow of respiratory gases for supply via or through the frame (402), the coupling member (404) being arranged to be removably or permanently coupled with the frame (402).

49. The nasal cannula system of claim 48, comprising

at least one inlet conduit (302) arranged to be coupled with the coupling member (404), and to receive the flow of respiratory gases for supply to the coupling member (404); and/or

a headgear (306) arranged to be removably and/or adjustably coupled with the frame (402) and to extend around a rear of a head of the patient to secure the frame (402) in position on the head.

50. The nasal cannula system of claim 49, wherein each of the at least one inlet conduit (302) comprises a tubing (312) that is at least partially formed from a breathable material.

51. The nasal cannula system of claim 49 or 50, wherein a first inlet conduit (302) of the at least one inlet conduit (302) is arranged to be removably coupled with the coupling member (404) in a single orientation.

52. The nasal cannula system of claim 49 or 50, wherein a first inlet conduit (302) of the at least one inlet conduit (302) is arranged to be selectively and removably coupled with the coupling member (404) in at least two different orientations,

optionally, the at least two different orientations comprises a first operational configuration and a second operational configuration.

53. The nasal cannula system of claim 49 or 50, the at least one conduit comprising a first inlet conduit (302) and a second inlet conduit (302), wherein:

the first inlet conduit (302) is arranged to be removably coupled to a first inlet of the coupling member (404); and

the second inlet conduit (302) is arranged to be removably coupled to a second inlet of the coupling member (404).

54. The nasal cannula system of any one of claims 48 to 53, wherein:

the frame (402) is arranged to be selectively removably coupled to any one of the first nasal prong module (408, 508, 608, 708) and the second nasal prong module (408, 508, 608, 708), adjacent a posterior side of the frame (402), and

the coupling member (404) is arranged to be removably or permanently coupled with the frame (402) adjacent an anterior side of the frame (402).

55. A nasal prong module (408, 508, 608, 708) for use in a nasal cannula (304, 400) of a respiratory support system (100, 200) arranged to deliver a flow of respiratory gases to an upper airway of a patient, the nasal prong module (408, 508, 608, 708) comprising:

a base portion (420, 520, 620, 720) arranged to be removably coupled with a frame (402) of the nasal cannula, the frame (402) arranged to support the nasal prong module (408, 508, 608, 708) in position, e.g., at an upper lip region of the patient;

a body portion (440, 540, 640, 740) coupled with the base portion (420, 520, 620, 720); and

any one or both of:

a first nasal prong (406a, 506a, 606a, 706a) coupled with and extending from the body portion (440, 540, 640, 740); and

a second nasal prong (406b, 506b, 606b, 706b) coupled with and extending from the body portion (440, 540, 640, 740),

wherein the body portion (440, 540, 640, 740) is arranged to receive the flow of respiratory gases for delivery to the upper airway of the patient via any one or both of the first nasal prong (406a, 506a, 606a, 706a) and the second nasal prong (406b, 506b, 606b, 706b).

56. The nasal prong module (408, 508, 608, 708) of claim 55, comprising the first nasal prong (406a, 506a, 606a, 706a) and the second nasal prong (406b, 506b, 606b, 706b).

57. The nasal prong module (408, 508, 608, 708) of claim 56, the first nasal prong (406a, 506a, 606a, 706a) and the second nasal prong (406b, 506b, 606b, 706b) comprising an asymmetric nasal prong geometry defined by:

an internal transverse dimension or cross-sectional area of the first nasal prong (406a, 506a, 606a, 706a) being different from a corresponding internal transverse dimension or cross-sectional area of the second nasal prong (406b, 506b, 606b, 706b); and/or

an external transverse dimension or cross-sectional area of the first nasal prong (406a, 506a, 606a, 706a) being different from a corresponding external transverse dimension or cross-sectional area of the second nasal prong (406b, 506b, 606b, 706b).

58. The nasal prong module (408, 508, 608, 708) of any one of claims 55 to 57, arranged to provide asymmetric nasal high flow therapy to the patient.

59. The nasal prong module (408, 508, 608, 708) of claim 58, wherein:

the first nasal prong (406a, 506a, 606a, 706a) is arranged to extend into a left nostril of the patient to form a left nasal prong; and

the second nasal prong (406b, 506b, 606b, 706b) is arranged to extend into a right nostril of the patient to form a right nasal prong.

60. The nasal prong module (408, 508, 608, 708) of claim 59, the left nasal prong and the right nasal prong forming a left asymmetric nasal prong geometry such that:

an internal transverse dimension or cross-sectional area of the left nasal prong is greater than a corresponding internal transverse dimension or cross-sectional area of the right nasal prong; and/or

an external transverse dimension or cross-sectional area of the left nasal prong is greater than a corresponding external transverse dimension or cross-sectional area of the right nasal prong.

61. The nasal prong module (408, 508, 608, 708) of claim 59, the left nasal prong and the right nasal prong forming a right asymmetric nasal prong geometry such that:

an internal transverse dimension or cross-sectional area of the right nasal prong is greater than a corresponding internal transverse dimension or cross-sectional area of the left nasal prong; and/or

an external transverse dimension or cross-sectional area of the right nasal prong is greater than a corresponding external transverse dimension or cross-sectional area of the left nasal prong.

62. The nasal prong module (408, 508, 608, 708) of any one of claims 55 to 61, the nasal prong module (408, 508, 608, 708) arranged to interact with the flow of respiratory gases to provide an asymmetric nasal high flow therapy.

63. The nasal prong module (408, 508, 608, 708) of claim 55, comprising the first nasal prong (406a, 506a, 606a, 706a) and the second nasal prong (406b, 506b, 606b, 706b),

wherein the first nasal prong (406a, 506a, 606a, 706a) and the second nasal prong (406b, 506b, 606b, 706b) form a symmetric nasal prong geometry.

64. The nasal prong module (408, 508, 608, 708) of claim 55 or 63, wherein the nasal prong module (408, 508, 608, 708) is arranged to interact with the flow of respiratory gases to provide a symmetric nasal high flow therapy.

65. The nasal prong module (408, 508, 608, 708) of any one of claims 55 to 64, the base portion (420, 520, 620, 720) comprising at least one gases inlet aperture (450) arranged to receive the flow of respiratory gases for supply to the body portion (440, 540, 640, 740) and any one or both of the first nasal prong (406a, 506a, 606a, 706a) and the second nasal prong (406b, 506b, 606b, 706b).

66. The nasal prong module (408, 508, 608, 708) of claim 65, wherein the at least one gases inlet aperture (450) is arranged to be fluidly, such as pneumatically, coupled with at least one inlet conduit (302) supplying the flow of respiratory gases.

67. The nasal prong module (408, 508, 608, 708) of claim 65 or 66, wherein the at least one gases inlet aperture (450) comprises a first gases inlet aperture (450a) and a second gases inlet aperture (450b).

68. The nasal prong module (408, 508, 608, 708) of claim 67, the nasal prong module (408, 508, 608, 708) comprising the first nasal prong (406a, 506a, 606a, 706a) and the second nasal prong (406b, 506b, 606b, 706b), wherein the first nasal prong (406a, 506a, 606a, 706a) is fluidly, such as pneumatically, coupled with the first gases inlet aperture (450a) and the second nasal prong (406b, 506b, 606b, 706b) is fluidly, such as pneumatically, coupled with the second gases inlet aperture (450b).

69. The nasal prong module (408, 508, 608, 708) of any one of claims 65 to 68, wherein the body portion (440, 540, 640, 740) comprises at least one gas carrying portion (460) arranged to:

fluidly, such as pneumatically, couple with the at least one gases inlet aperture (450), and

provide gas flow path(s) for the flow of respiratory gases from the at least one gases inlet aperture (450) to any one or both of the first nasal prong (406a, 506a, 606a, 706a) and the second nasal prong (406b, 506b, 606b, 706b).

70. The nasal prong module (408, 508, 608, 708) of claim 69 when dependent from claim 68, wherein the at least one gas carrying portion (460) is arranged to fluidly, such as pneumatically, couple:

the first nasal prong (406a, 506a, 606a, 706a) with the first gases inlet aperture (450a) of the body portion (440, 540, 640, 740); and/or

the second nasal prong (406b, 506b, 606b, 706b) with the second gases inlet aperture (450b) of the body portion (440, 540, 640, 740).

71. The nasal prong module (408, 508, 608, 708) of claim 70, wherein the at least one gas carrying portion (460) comprises:

a first gas carrying portion (460a, 560a, 660a, 760a) fluidly, such as pneumatically, coupled with the first gases inlet aperture (450a) and the first nasal prong (406a, 506a, 606a, 706a); and

a second gas carrying portion (460b, 560b, 660b, 760b) fluidly, such as pneumatically, coupled with the second gases inlet aperture (450b) and the second nasal prong (406b, 506b, 606b, 706b).

72. The nasal prong module (408, 508, 608, 708) of claim 71, wherein the first gas carrying portion (460a, 560a, 660a, 760a) and the second gas carrying portion (460b, 560b, 660b, 760b) are separate from each other.

73. The nasal prong module (408, 508, 608, 708) of any one of claims 65 to 72, wherein the at least one gases inlet aperture (450) is arranged to be fluidly, such as pneumatically, coupled with at least one outlet opening (414) of the frame (402).

74. The nasal prong module (408, 508, 608, 708) of any one of claims 65 to 73, the at least one gases inlet aperture (450) comprising a first gases inlet aperture (450a) and a second gases inlet aperture (450b), wherein:

the first gases inlet aperture (450a) and the first nasal prong (406a, 506a, 606a, 706a) are arranged to fluidly, such as pneumatically, couple with a first outlet opening (414a) of the frame (402), and

the second gases inlet aperture (450b) and the second nasal prong (406b, 506b, 606b, 706b) are arranged to fluidly and/or sealingly couple with a second outlet opening (414b) of the frame (402).

75. The nasal prong module (408, 508, 608, 708) of claim 74, wherein the base portion (420, 520, 620, 720) is arranged to form a face seal with any one or both of the first outlet opening (414a) and the second outlet opening (414b) of the frame (402).

76. The nasal prong module (408, 508, 608, 708) of any one of claims 55 to 75, the base portion (420, 520, 620, 720) comprising a first gases inlet aperture (450a) and a

second gases inlet aperture (450b), and the body portion (440, 540, 640, 740) comprising a first gas carrying portion (460a, 560a, 660a, 760a) and a second gas carrying portion (460b, 560b, 660b, 760b), wherein:

the first gases inlet aperture (450a) of the base portion (420, 520, 620, 720) is arranged at least substantially coaxially with an inlet end of the first gas carrying portion (460a, 560a, 660a, 760a) of the body portion (440, 540, 640, 740); and/or

the second gases inlet aperture (450b) of the base portion (420, 520, 620, 720) is arranged at least substantially coaxially with an inlet end of the second gas carrying portion (460b, 560b, 660b, 760b) of the body portion (440, 540, 640, 740).

77. The nasal prong module (408, 508, 608, 708) of any one of claims 55 to 76, the base portion (420, 520, 620, 720) comprising a first gases inlet aperture (450a) and a second gases inlet aperture (450b), and the body portion (440, 540, 640, 740) comprising a first gas carrying portion (460a, 560a, 660a, 760a) and a second gas carrying portion (460b, 560b, 660b, 760b), wherein:

the first gases inlet aperture (450a) of the base portion (420, 520, 620, 720) comprises an internal transverse dimension or cross-sectional area equal to or greater than an internal transverse dimension or cross-sectional area of an inlet end of the first gas carrying portion (460a, 560a, 660a, 760a); and/or

the second gases inlet aperture (450b) of the base portion (420, 520, 620, 720) comprises an internal transverse dimension or cross-sectional area equal to or greater than an internal transverse dimension or cross-sectional area of an inlet end of the second gas carrying portion (460b, 560b, 660b, 760b).

78. The nasal prong module (408, 508, 608, 708) of any one of claims 55 to 77, the base portion (420, 520, 620, 720) comprising a recess (430) for accommodating or preventing interference with a portion of the nasal cannula (304, 400), such as a pin (412).

79. The nasal prong module (408, 508, 608, 708) of claim 78, the base portion (420, 520, 620, 720) comprising a first gases inlet aperture (450a) and a second gases inlet aperture (450b), wherein the recess (430) is positioned intermediate the first gases inlet aperture (450a) and the second gases inlet aperture (450b).

80. The nasal prong module (408, 508, 608, 708) of claim 78 or 79, wherein the recess (430) is circular or rectangular.

81. The nasal prong module (408, 508, 608, 708) of any one of claims 55 to 80, wherein:

the base portion (420, 520, 620, 720) is opaque, and/or

the body portion (440, 540, 640, 740) is translucent.

82. The nasal prong module (408, 508, 608, 708) of any one of claims 55 to 81, wherein the base portion (420, 520, 620, 720) comprises a first material and the body portion (440, 540, 640, 740) comprises a second material, wherein the first material is more rigid than the second material.

83. The nasal prong module (408, 508, 608, 708) of claim 82, wherein the second material is an elastomer.

84. The nasal prong module (408, 508, 608, 708) of claim 83, wherein the elastomer is silicone rubber.

85. The nasal prong module (408, 508, 608, 708) of any one of claims 55 to 82, wherein the body portion (440, 540, 640, 740) is at least partially made up of an elastomer, such as silicone rubber and/or a thermoplastic elastomer.

86. The nasal prong module (408, 508, 608, 708) of any one of claims 55 to 85, wherein the base portion (420, 520, 620, 720) is at least partially made up of any one or more of polypropylene, nylon, acrylonitrile butadiene styrene (ABS), polycarbonates, and polyoxymethylene (POM).

87. The nasal prong module (408, 508, 608, 708) of any one of claims 55 to 86, wherein the base portion (420, 520, 620, 720) has a different color compared to the body portion (440, 540, 640, 740).

88. The nasal prong module (408, 508, 608, 708) of any one of claims 55 to 86, wherein the base portion (420, 520, 620, 720) has a first color and a second color, wherein the first color is associated with a geometry of the first nasal prong (406a, 506a, 606a, 706a) and the second color is associated with a geometry of the second nasal prong (406b, 506b, 606b, 706b).

89. The nasal prong module (408, 508, 608, 708) of claim 88, wherein:

the nasal prong module (408, 508, 608, 708) comprises an asymmetric nasal prong geometry, wherein the second color is different to the first color; or

the nasal prong module (408, 508, 608, 708) comprises a symmetric nasal prong geometry, wherein the second color is the same as the first color.

90. The nasal prong module (408, 508, 608, 708) of any one of claims 55 to 89, the body portion (440, 540, 640, 740) at least in part defining a cavity separated from:

at least one gas carrying portion (460) of the body portion (440, 540, 640, 740), and/or

a flow path for the flow of respiratory gases through the nasal prong module (408, 508, 608, 708).

91. The nasal prong module (408, 508, 608, 708) of claim 90, the body portion (440, 540, 640, 740) comprising a first gas carrying portion (460a, 560a, 660a, 760a) and a second gas carrying portion (460b, 560b, 660b, 760b), wherein the cavity is separated from the first gas carrying portion (460a, 560a, 660a, 760a) and the second gas carrying portion (460b, 560b, 660b, 760b).

92. The nasal prong module (408, 508, 608, 708) of claim 90 or 91, wherein the cavity is open to ambient air.

93. The nasal prong module (408, 508, 608, 708) of any one of claims 90 to 92, wherein the cavity is open to ambient air at a lower region of the body portion (440, 540, 640, 740).

94. The nasal prong module (408, 508, 608, 708) of any one of claims 90 to 93, wherein the cavity is at least in part located in a central region (445), such as a laterally central region, of the body portion (440, 540, 640, 740).

95. The nasal prong module (408, 508, 608, 708) of any one of claims 90 to 93, the base portion (420, 520, 620, 720) comprising a first gases inlet aperture (450a) and a second gases inlet aperture (450b), wherein the cavity is at least in part located between, such as laterally between, the first gases inlet aperture (450a) and the second gases inlet aperture (450b).

96. The nasal prong module (408, 508, 608, 708) of any one of claims 90 to 95, the body portion (440, 540, 640, 740) comprising:

a first longitudinal side wall (441),

a first lateral side wall (442),

a second lateral side wall (443), and

a posterior wall (444),

the first longitudinal side wall (441), the first lateral side wall (442), and the second lateral side wall (443) at least in part defining the cavity.

97. The nasal prong module (408, 508, 608, 708) of claim 96, a central region (445) of the posterior wall (444) comprising:

a posterior side arranged to engage the upper lip region of the patient, and

an anterior side opposing the posterior surface (445a), the anterior side exposed to ambient air within the cavity.

98. The nasal prong module (408, 508, 608, 708) of claim 97, wherein at least a portion of the first nasal prong (406a, 506a, 606a, 706a) and the second nasal prong (406b, 506b, 606b, 706b) projects or extends from the first longitudinal side wall (441) and/or the posterior wall (444), in a posterior direction away from the base portion (420, 520, 620, 720).

99. The nasal prong module (408, 508, 608, 708) of any one of claims 96 to 98, wherein the cavity is further defined by any one or more of:

the base portion (420, 520, 620, 720),

a second longitudinal side wall of the body portion (440, 540, 640, 740),

at least one gas carrying portion (460) of the body portion (440, 540, 640, 740),

the first nasal prong (406a, 506a, 606a, 706a), and

the second nasal prong (406b, 506b, 606b, 706b).

100. The nasal prong module (408, 508, 608, 708) of claim 99, wherein the cavity provides an air gap (470) between the at least one gas carrying portion (460) and any one or more of:

at least a portion of the posterior wall (444);

at least a portion of the first longitudinal side wall (441) of the body portion (440, 540, 640, 740);

at least a portion of the second longitudinal side wall of the body portion (440, 540, 640, 740);

the first lateral side wall (442); and

the second lateral side wall (443).

101. The nasal prong module (408, 508, 608, 708) of any one of claims 90 to 100, the body portion (440, 540, 640, 740) comprising a first gas carrying portion (460a, 560a, 660a, 760a) and a second gas carrying portion (460b, 560b, 660b, 760b), the cavity providing an air gap (470) between the first gas carrying portion (460a, 560a, 660a, 760a) and the second gas carrying portion (460b, 560b, 660b, 760b).

102. The nasal prong module (408, 508, 608, 708) of any one of claims 55 to 101, the body portion (440, 540, 640, 740) comprising:

a posterior wall (444) arranged to engage the upper lip region of the patient, and

a pair of lateral extensions (471, 472), the pair of lateral extensions (471, 472) extending laterally from the posterior wall (444) beyond any one or both of:

the base portion (420, 520, 620, 720); and

a first lateral side wall (442) and a second lateral side wall (443) of the body portion (440, 540, 640, 740), respectively.

103. The nasal prong module (408, 508, 608, 708) of claim 102, the pair of lateral extensions (471, 472) cantilevered from any one or both of:

the posterior wall (444), and

the first lateral side wall (442) and the second lateral side wall (443) of the body portion (440, 540, 640, 740), respectively.

104. The nasal prong module (408, 508, 608, 708) of claim 102 or 103, wherein the pair of lateral extensions (471, 472) comprise a varying thickness.

105. The nasal prong module (408, 508, 608, 708) of any one of claims 102 to 104, wherein a thickness of each of the pair of lateral extensions (471, 472) tapers from a first end to a second end, optionally, the first end is proximate a/the central region (445) of the posterior wall (444) and the second end is distal from the central region (445) of the posterior wall (444).

106. The nasal prong module (408, 508, 608, 708) of any one of claims 102 to 105, wherein the pair of lateral extensions (471, 472) are arranged to:

cushion the patient from the frame (402); and/or

provide decoupling elements for removal of the nasal prong module (408, 508, 608, 708) from the frame (402).

107. The nasal prong module (408, 508, 608, 708) of any one of claims 102 to 106, wherein distal ends of the pair of lateral extensions (471, 472) are arranged to be spaced from the frame (402) when the nasal prong module (408, 508, 608, 708) is coupled with the frame (402) but before the nasal cannula (304, 400) is fitted to the patient.

108. The nasal prong module (408, 508, 608, 708) of any one of claims 102 to 107, wherein distal ends of the pair of lateral extensions (471, 472) are arranged to be supported by or contact the frame (402) when the nasal prong module (408, 508, 608, 708) is coupled with the frame (402) and the nasal cannula (304, 400) is fitted to the patient or pressed against the patient's face by an external force.

109. The nasal prong module (408, 508, 608, 708) of any one of claims 102 to 108, wherein the posterior wall (444) and the pair of lateral extensions (471, 472) together form a posterior contact surface of the body portion (440, 540, 640, 740).

110. The nasal prong module (408, 508, 608, 708) of claim 109, wherein the posterior contact surface comprises a continuous curve arranged to at least substantially follow a curvature of an upper lip region of the patient.

111. The nasal prong module (408, 508, 608, 708) of any one of claims 55 to 110, wherein a posterior side of the base portion (420, 520, 620, 720) comprises a concave curve structure.

112. The nasal prong module (408, 508, 608, 708) of any one of claims 55 to 111, wherein the base portion (420, 520, 620, 720) comprises a central waist region, a height of the body portion (440, 540, 640, 740) at least in part tapering towards the central waist region.

113. The nasal prong module (408, 508, 608, 708) of any one of claims 55 to 112, wherein the base portion (420, 520, 620, 720) is arranged to resiliently flex upon removal of the nasal prong module (408, 508, 608, 708) from the frame (402).

114. The nasal prong module (408, 508, 608, 708) of any one of claims 55 to 113, wherein the base portion (420, 520, 620, 720) is arranged to couple with the frame (402) in only a single orientation.

115. The nasal prong module (408, 508, 608, 708) of any one of claims 55 to 114, wherein the base portion (420, 520, 620, 720) comprises one or more coupling

structures (480) arranged to removably engage and/or cooperate with one or more corresponding attachment structures (490) of the frame (402).

116. The nasal prong module (408, 508, 608, 708) of claim 115, wherein the one or more coupling structures (480) of the base portion (420, 520, 620, 720) are arranged to be removably coupled with the one or more corresponding attachment structures (490) of the frame (402) in a removable snap fit.

117. The nasal prong module (408, 508, 608, 708) of claim 116, wherein the removable snap fit is arranged to provide any one or more of:

tactile feedback;

audible feedback; and

visual feedback.

118. The nasal prong module (408, 508, 608, 708) of any one of claims 115 to 117, wherein, when removably coupled to the one or more attachment structures (490) of the frame (402), the one or more coupling structures (480) of the base portion (420, 520, 620, 720) are arranged to abut or be proximate to a coupling member (404) of the nasal cannula assembly (150) to provide visual feedback.

119. The nasal prong module (408, 508, 608, 708) of any one of claims 115 or 117-118, wherein the one or more of the coupling structures (480) are arranged to resiliently deflect and at least partially recover as the base portion (420, 520, 620, 720) is coupled with the frame (402).

120. The nasal prong module (408, 508, 608, 708) of any one of claims 115 to 119, wherein the one or more coupling structures (480) are each bisected by a sagittal plane (S) of the nasal prong module (408, 508, 608, 708).

121. The nasal prong module (408, 508, 608, 708) of any one of claims 115 to 120, wherein the one or more coupling structures (480) project in an anterior direction, away from the body portion (440, 540, 640, 740).

122. The nasal prong module (408, 508, 608, 708) of any one of claims 115 to 121, wherein each of the one or more coupling structures (480) comprises a protrusion (491) arranged to engage or mate with a recess or underside portion of the respective one or more attachment structures (490) of the frame (402).

123. The nasal prong module (408, 508, 608, 708) of claim 122, wherein the protrusions (491) are located on inward surfaces at or proximate distal ends of the one or more coupling structures (480).

124. The nasal prong module (408, 508, 608, 708) of any one of claims 115 to 123, wherein the base portion (420, 520, 620, 720) comprises a pair of coupling structures (480) arranged to cooperate with a corresponding pair of attachment structures (490) of the frame (402).

125. The nasal prong module (408, 508, 608, 708) of claim 124, wherein at least one of the pair of coupling structures (480) comprises at least one slot (481) arranged to cooperate with at least one corresponding protrusion (491) of the frame (402).

126. The nasal prong module (408, 508, 608, 708) of claim 125, wherein the at least one slot (481) is centrally located on the respective coupling structure.

127. The nasal prong module (408, 508, 608, 708) of any one of any one of claims 124 to 126, wherein:

one of the pair of coupling structures (480) is located on a first longitudinal side of the base portion (420, 520, 620, 720) and the other of the pair of coupling structures (480) is located on a second longitudinal side of the base portion (420, 520, 620, 720); and

the first longitudinal side of the base portion (420, 520, 620, 720) is on the same side as a/the first longitudinal side of the body portion (440, 540, 640, 740).

128. The nasal prong module (408, 508, 608, 708) of claim 127, at least one of the pair of coupling structures (480) comprising at least one slot (481) arranged to cooperate with at least one corresponding protrusion (491) of the frame (402), wherein the coupling structure (480) on the first longitudinal side of the base portion (420, 520, 620, 720) comprises the at least one slot (481).

129. The nasal prong module (408, 508, 608, 708) of claim 127, at least one of the pair of coupling structures (480) comprising at least one slot (481) arranged to cooperate with at least one corresponding protrusion (491) of the frame (402), wherein the coupling structure (480) on the second longitudinal side of the base portion (420, 520, 620, 720) comprises the at least one slot (481).

130. The nasal prong module (408, 508, 608, 708) of any one of claims 124 to 129, wherein the pair of coupling structures (480) are located in an opposing relationship.

131. The nasal prong module (408, 508, 608, 708) of any one of claims 124 to 130, the pair of coupling structures (480) comprising a first coupling structure and a second coupling structure, the first coupling structure comprising a first coupling structure geometry and the second coupling structure comprising a second coupling structure geometry different to the first coupling structure geometry.

132. The nasal prong module (408, 508, 608, 708) of claim 131, wherein the first coupling structure is wider than the second coupling structure.

133. The nasal prong module (408, 508, 608, 708) of any one of claims 55 to 132, wherein the base portion (420, 520, 620, 720) and the body portion (440, 540, 640, 740) are integrally formed.

134. A nasal prong module (408, 508, 608, 708) for use in a nasal cannula assembly (150) of a respiratory support system (100, 200) arranged to deliver a flow of respiratory gases to an upper airway of a patient, the nasal prong module (408, 508, 608, 708) comprising a body portion (440, 540, 640, 740) comprising:

at least one gas carrying portion (460);

a cavity; and

a posterior wall (444) arranged to contact and/or engage the upper lip region of the patient; and

wherein the cavity is positioned between at least a portion of the posterior wall (444) and the at least one gas carrying portion (460).

135. The nasal prong module (408, 508, 608, 708) of claim 134, wherein the cavity is arranged to provide a separation, such as thermally spacing, from at least a portion of the at least one gas carrying portion (460) and at least a portion of the remainder of the body portion (440, 540, 640, 740), such as at least a portion of the posterior wall (444).

136. The nasal prong module (408, 508, 608, 708) of claim 134 or 135, wherein the cavity is exposed to ambient air.

137. The nasal prong module (408, 508, 608, 708) of any one of claims 134 to 136, wherein the cavity is at least in part located in a central region (445) of the body portion (440, 540, 640, 740).

138. The nasal prong module (408, 508, 608, 708) of any one of claims 134 to 137, wherein the body portion (440, 540, 640, 740) comprises:

a first longitudinal side wall (441),

a first lateral side wall (442), and

a second lateral side wall (443),

the first longitudinal side wall (441), the first lateral side wall (442), and the second lateral side wall (443) at least in part defining the cavity.

139. The nasal prong module (408, 508, 608, 708) of claim 138, wherein the cavity is further defined by any one or more of:

a base portion (420, 520, 620, 720) of the nasal prong module (408, 508, 608, 708);

a second longitudinal side wall of the body portion (440, 540, 640, 740);

the at least one gas carrying portion (460); and

at least one nasal prong of the nasal prong module (408, 508, 608, 708).

140. The nasal prong module (408, 508, 608, 708) of claim 139, wherein the cavity provides an air gap (470) between the at least one gas carrying portion (460) and any one or more of:

the second longitudinal side wall of the body portion (440, 540, 640, 740);

the first lateral side wall (442); and

the second lateral side wall (443).

141. The nasal prong module (408, 508, 608, 708) of claim 140, wherein:

the at least one gas carrying portion (460) comprises a first gas carrying portion (460a, 560a, 660a, 760a) and a second gas carrying portion (460b, 560b, 660b, 760b); and

the cavity provides an air gap (470) between the first gas carrying portion (460a, 560a, 660a, 760a) and the second gas carrying portion (460b, 560b, 660b, 760b).

142. The nasal prong module (408, 508, 608, 708) of any one of claims 134 to 141, wherein the posterior wall (444) comprises:

a posterior surface (445a) arranged to engage an upper lip region of the patient;
and

an anterior surface (445b) opposing the posterior surface (445a), the anterior surface (445b) being exposed to the ambient air within the cavity.

143. A nasal cannula (304, 400) for use in a nasal cannula assembly (150) of a respiratory support system (100, 200) arranged to deliver a flow of respiratory gases to an upper airway of a patient, the nasal cannula (304, 400) comprising:

a patient-contacting portion comprising a posterior wall (444) arranged to contact and/or engage an upper lip region of the patient, and

at least one gas carrying portion (460),

wherein the nasal cannula (304, 400) comprises a cavity positioned between at least a portion of the posterior wall (444) and the at least one gas carrying portion (460).

144. The nasal cannula (304, 400) of claim 143, wherein the cavity is arranged to at least partially thermally isolate the at least one gas carrying portion (460) from at least a portion of the posterior wall (444).

145. The nasal cannula (304, 400) of claim 143, wherein the cavity is exposed to ambient air.

146. The nasal cannula (304, 400) of claim 143 or 145, wherein the cavity is at least in part located in a central region (445) of the patient-contacting portion.

147. The nasal cannula (304, 400) of any one of claims 143 to 146, wherein the patient-contacting portion comprises:

a first longitudinal side wall (441),

a first lateral side wall (442), and

a second lateral side wall (443),

the first longitudinal side wall (441), the first lateral side wall (442), and the second lateral side wall (443) at least in part defining the cavity.

148. The nasal cannula (304, 400) of claim 147, wherein the cavity is further defined by any one or more of:

a second longitudinal side wall of the patient-contacting portion;

the at least one gas carrying portion (460);

a first nasal prong (406a, 506a, 606a, 706a) of the nasal cannula; and

a second nasal prong (406b, 506b, 606b, 706b) of the nasal cannula.

149. The nasal cannula (304, 400) of claim 148, wherein the cavity provides an air gap (470) between the at least one gas carrying portion (460) and any one or more of:

the second longitudinal side wall of the body portion (440, 540, 640, 740);

the first lateral side wall (442); and

the second lateral side wall (443).

150. The nasal cannula (304, 400) of claim 149, wherein:

the at least one gas carrying portion (460) comprises a first gas carrying portion (460a, 560a, 660a, 760a) and a second gas carrying portion (460b, 560b, 660b, 760b); and

the cavity provides an air gap (470) between the first gas carrying portion (460a, 560a, 660a, 760a) and the second gas carrying portion (460b, 560b, 660b, 760b).

151. A nasal prong module (408, 508, 608, 708) for use in a nasal cannula assembly (150) of a respiratory support system (100, 200) arranged to deliver a flow of respiratory gases to an upper airway of a patient, the nasal prong module (408, 508, 608, 708) comprising one or more coupling structures (480) arranged to engage and/or cooperate with one or more corresponding attachment structures (490) of a frame (402) of the nasal cannula assembly (150).

152. The nasal prong module (408, 508, 608, 708) of claim 151 comprising a base portion (420, 520, 620, 720), the base portion (420, 520, 620, 720) comprising the one or more coupling structures (480).

153. The nasal prong module (408, 508, 608, 708) of claim 152, comprising a body portion (440, 540, 640, 740) coupled to the base portion (420, 520, 620, 720).

154. The nasal prong module (408, 508, 608, 708) of claim 153, wherein the base portion (420, 520, 620, 720) and the body portion (440, 540, 640, 740) are integrally formed.

155. The nasal prong module (408, 508, 608, 708) of claim 153 or 154, wherein the one or more coupling structures (480) project in an anterior direction, away from the body portion (440, 540, 640, 740).

156. The nasal prong module (408, 508, 608, 708) of any one of claims 151 to 155, wherein each of the one or more coupling structures (480) comprises a protrusion (491) arranged to mate with a recess of the respective one or more attachment structures (490) of the frame (402).

157. The nasal prong module (408, 508, 608, 708) of claim 156, wherein the protrusions (491) are located on inward surfaces at or proximate distal ends of the one or more coupling structures (480).

158. The nasal prong module (408, 508, 608, 708) of any one of claims 152 to 156, the base portion (420, 520, 620, 720) comprising a pair of coupling structures (480) arranged to cooperate with a corresponding pair of attachment structures (490) of the frame (402).

159. The nasal prong module (408, 508, 608, 708) of claim 158, wherein one of the pair of coupling structures (480) is located on a first longitudinal side of the base portion (420, 520, 620, 720) and the other of the pair of coupling structures (480) is located on a second longitudinal side of the base portion (420, 520, 620, 720).

160. The nasal prong module (408, 508, 608, 708) of claim 158 or 159, wherein at least one of the pair of coupling structures (480) comprises at least one slot (481) arranged to cooperate with at least one protrusion (491) of the frame (402).

161. The nasal prong module (408, 508, 608, 708) of claim 160, wherein the at least one slot (481) is centrally located on the respective coupling structure.

162. The nasal prong module (408, 508, 608, 708) of any one of claims 158 to 161, wherein the pair of coupling structures (480) are located in an opposing relationship.

163. The nasal prong module (408, 508, 608, 708) of any one of claims 158 to 162, the pair of coupling structures (480) comprising a first coupling structure and a second coupling structure, the first coupling structure comprising a first coupling structure geometry and the second coupling structure comprising a second coupling structure geometry different to the first coupling structure geometry.

164. The nasal prong module (408, 508, 608, 708) of claim 163, wherein the first coupling structure is wider than the second coupling structure.

165. A kit of parts for a nasal cannula assembly (150), the kit of parts comprising:

at least one nasal prong module (408, 508, 608, 708) according to any one of claims 55-142 or 151-164, and

any one or more of:

the frame (402);

a coupling member (404) arranged to be coupled with the frame (402);

at least one inlet conduit (302) arranged to be coupled with the coupling member (404);

at least one coupling member connector (405) arranged to couple the at least one inlet conduit (302) with the coupling member (404); and

headgear (306) arranged to be coupled with the frame (402) for securing the nasal cannula assembly (150) to a patient's head.

166. A kit of parts for a nasal cannula assembly (150), the kit of parts comprising:

a frame (402);

a coupling member (404) arranged to be coupled with the frame (402); and

at least one inlet conduit (302) arranged to be coupled with the coupling member (404).

167. A kit of parts for a nasal cannula (304, 400), the kit of parts comprising a nasal prong module (408, 508, 608, 708), the nasal prong module (408, 508, 608, 708) comprising:

a first nasal prong (406a, 506a, 606a, 706a) arranged to form a left nasal prong; and

a second nasal prong (406b, 506b, 606b, 706b) arranged to form a right nasal prong,

wherein the left nasal prong and the right nasal prong form a left asymmetric nasal prong geometry such that:

an internal transverse dimension or cross-sectional area of the left nasal prong is greater than a corresponding internal transverse dimension or cross-sectional area of the right nasal prong; and/or

an external transverse dimension or cross-sectional area of the left nasal prong is greater than a corresponding external transverse dimension or cross-sectional area of the right nasal prong.

168. A kit of parts for a nasal cannula (304, 400), the kit of parts comprising a nasal prong module (408, 508, 608, 708), the nasal prong module (408, 508, 608, 708) comprising:

a first nasal prong (406a, 506a, 606a, 706a) arranged to form a left nasal prong; and

a second nasal prong (406b, 506b, 606b, 706b) arranged to form a right nasal prong,

wherein the left nasal prong and right nasal prong form a right asymmetric nasal prong geometry such that:

an internal transverse dimension or cross-sectional area of the right nasal prong is greater than a corresponding internal transverse dimension or cross-sectional area of the left nasal prong; and/or

an external transverse dimension or cross-sectional area of the right nasal prong is greater than a corresponding external transverse dimension or cross-sectional area of the left nasal prong.

169. A kit of parts for a nasal cannula system, the kit of parts comprising two or more nasal prong modules (408, 508, 608, 708), the two or more nasal prong modules (408, 508, 608, 708) comprising:

a first nasal prong module (408, 508, 608, 708) comprising:

a first nasal prong (406a, 506a, 606a, 706a) arranged to form a first left nasal prong (406a, 506a, 606a, 706a); and

a second nasal prong (406b, 506b, 606b, 706b) arranged to form a first right nasal prong (406b, 506b, 606b, 706b), wherein the first nasal prong module (408, 508, 608, 708) (e.g., the first left nasal prong and the first right nasal prong) comprises or forms a first nasal prong geometry; and

a second nasal prong module (408, 508, 608, 708) comprising:

a first nasal prong (406a, 506a, 606a, 706a) arranged to form a second left nasal prong (406a, 506a, 606a, 706a); and

a second nasal prong (406b, 506b, 606b, 706b) arranged to form a second right nasal prong (406b, 506b, 606b, 706b), wherein the second nasal prong module (408, 508, 608, 708) (e.g., the second left nasal prong and the second right nasal prong) comprises or forms a second nasal prong (406b, 506b, 606b, 706b) geometry,

wherein the first nasal prong geometry is different from the second nasal prong geometry.

170. The kit of parts of claim 169, wherein a frame (402) of the nasal cannula system is arranged to be selectively removably coupled to any one of the two or more nasal prong modules (408, 508, 608, 708).

171. The kit of parts of claim 169 or 170, wherein:

the first nasal prong geometry is or forms a left asymmetric nasal prong geometry such that:

an internal transverse dimension or cross-sectional area of the first left nasal prong (406a, 506a, 606a, 706a) is greater than a corresponding internal transverse dimension or cross-sectional area of the first right nasal prong (406b, 506b, 606b, 706b); and/or

an external transverse dimension or cross-sectional area of the first left nasal prong (406a, 506a, 606a, 706a) is greater than a corresponding external transverse dimension or cross-sectional area of the first right nasal prong (406b, 506b, 606b, 706b),

wherein optionally the first left nasal prong (406a, 506a, 606a, 706a) is arranged to provide a greater volumetric flow rate than the first right nasal prong (406b, 506b, 606b, 706b), and

the second nasal prong geometry is or forms a right asymmetric nasal prong geometry such that:

an internal transverse dimension or cross-sectional area of the second right nasal prong (406b, 506b, 606b, 706b) is greater than a corresponding internal transverse dimension or cross-sectional area of the second left nasal prong (406a, 506a, 606a, 706a); and/or

an external transverse dimension or cross-sectional area of the second right nasal prong (406b, 506b, 606b, 706b) is greater than a corresponding external transverse dimension or cross-sectional area of the second left nasal prong (406a, 506a, 606a, 706a),

wherein optionally the second right nasal prong (406b, 506b, 606b, 706b) is arranged to provide a greater volumetric flow rate than the second left nasal prong (406a, 506a, 606a, 706a).

172. The kit of parts of claim 169 or 170, wherein:

the first nasal prong geometry is or forms a left asymmetric nasal prong geometry such that:

an internal transverse dimension or cross-sectional area of the first left nasal prong (406a, 506a, 606a, 706a) is greater than a corresponding internal transverse dimension or cross-sectional area of the first right nasal prong (406b, 506b, 606b, 706b); and/or

an external transverse dimension or cross-sectional area of the first left nasal prong (406a, 506a, 606a, 706a) is greater than a corresponding external transverse dimension or cross-sectional area of the first right nasal prong (406b, 506b, 606b, 706b),

wherein optionally the first left nasal prong (406a, 506a, 606a, 706a) is arranged to provide a greater volumetric flow rate than the first right nasal prong (406b, 506b, 606b, 706b), and

the second nasal prong geometry is or forms a left asymmetric nasal prong geometry such that:

an internal transverse dimension or cross-sectional area of the second left nasal prong (406a, 506a, 606a, 706a) is greater than a corresponding internal transverse dimension or cross-sectional area of the second right nasal prong (406b, 506b, 606b, 706b); and/or

an external transverse dimension or cross-sectional area of the second left nasal prong (406a, 506a, 606a, 706a) is greater than a corresponding external transverse dimension or cross-sectional area of the second right nasal prong (406b, 506b, 606b, 706b),

wherein optionally the second left nasal prong (406a, 506a, 606a, 706a) is arranged to provide a greater volumetric flow rate than the second right nasal prong (406b, 506b, 606b, 706b).

173. The kit of parts of claim 169 or 170, wherein:

the first nasal prong geometry is or forms a right asymmetric nasal prong geometry such that:

an internal transverse dimension or cross-sectional area of the first right nasal prong (406b, 506b, 606b, 706b) is greater than a corresponding internal transverse dimension or cross-sectional area of the first left nasal prong (406a, 506a, 606a, 706a); and/or

an external transverse dimension or cross-sectional area of the first right nasal prong (406b, 506b, 606b, 706b) is greater than a corresponding external transverse dimension or cross-sectional area of the first left nasal prong (406a, 506a, 606a, 706a),

wherein optionally the first right nasal prong (406b, 506b, 606b, 706b) is arranged to provide a greater volumetric flow rate than the first left nasal prong (406a, 506a, 606a, 706a), and

the second nasal prong geometry is or forms a right asymmetric nasal prong geometry such that:

an internal transverse dimension or cross-sectional area of the second right nasal prong (406b, 506b, 606b, 706b) is greater than a corresponding internal transverse dimension or cross-sectional area of the second left nasal prong (406a, 506a, 606a, 706a); and/or

an external transverse dimension or cross-sectional area of the second right nasal prong (406b, 506b, 606b, 706b) is greater than a corresponding external transverse dimension or cross-sectional area of the second left nasal prong (406a, 506a, 606a, 706a),

wherein optionally the second right nasal prong (406b, 506b, 606b, 706b) is arranged to provide a greater volumetric flow rate than the second left nasal prong (406a, 506a, 606a, 706a).

174. The kit of parts of claim 172 or 173, wherein:

the internal transverse dimension or cross-sectional area of the first left nasal prong (406a, 506a, 606a, 706a) is greater than the internal transverse dimension or cross-sectional area of the second left nasal prong (406a, 506a, 606a, 706a); and/or

the external transverse dimension or cross-sectional area of the first left nasal prong (406a, 506a, 606a, 706a) is greater than the external transverse dimension or cross-sectional area of the second left nasal prong (406a, 506a, 606a, 706a).

175. The kit of parts of any one of claims 172 to 174, wherein:

the internal transverse dimension or cross-sectional area of the first right nasal prong (406b, 506b, 606b, 706b) is greater than the internal transverse dimension or cross-sectional area of the second right nasal prong (406b, 506b, 606b, 706b); and/or

the external transverse dimension or cross-sectional area of the first right nasal prong (406b, 506b, 606b, 706b) is greater than the external transverse dimension or cross-sectional area of the second right nasal prong (406b, 506b, 606b, 706b).

176. The kit of parts of any one of claims 172 to 175, wherein the two or more nasal prong modules (408, 508, 608, 708) comprises a third nasal prong module (408, 508, 608, 708), the third nasal prong module (408, 508, 608, 708) comprising:

a first nasal prong (406a, 506a, 606a, 706a) arranged to extend into a left nostril of the patient and form a third left nasal prong; and

a second nasal prong (406b, 506b, 606b, 706b) arranged to extend into a right nostril of the patient and form a third right nasal prong, wherein the third left nasal prong and the third right nasal prong comprise or form a third nasal prong geometry,

wherein:

the third nasal prong geometry is or forms a left asymmetric nasal prong geometry such that:

an internal transverse dimension or cross-sectional area of the third left nasal prong is greater than a corresponding internal transverse dimension or cross-sectional area of the third right nasal prong; and/or

an external transverse dimension or cross-sectional area of the third left nasal prong is greater than a corresponding external transverse dimension or cross-sectional area of the third right nasal prong,

wherein optionally the third left nasal prong is arranged to provide a greater volumetric flow rate than the third right nasal prong.

177. The kit of parts of any one of claims 172 to 175, wherein the two or more nasal prong modules (408, 508, 608, 708) comprises a third nasal prong module (408, 508, 608, 708), the third nasal prong module (408, 508, 608, 708) comprising:

a first nasal prong (406a, 506a, 606a, 706a) arranged to extend into a left nostril of the patient and form a third left nasal prong; and

a second nasal prong (406b, 506b, 606b, 706b) arranged to extend into a right nostril of the patient and form a third right nasal prong, wherein the third left nasal prong and the third right nasal prong comprise or form a third nasal prong geometry,

wherein:

the third nasal prong geometry is or forms a right asymmetric nasal prong geometry such that:

an internal transverse dimension or cross-sectional area of the third right nasal prong is greater than a corresponding internal transverse dimension or cross-sectional area of the third left nasal prong; and/or

an external transverse dimension or cross-sectional area of the third right nasal prong is greater than a corresponding external transverse dimension or cross-sectional area of the third left nasal prong,

wherein optionally the third right nasal prong is arranged to provide a greater volumetric flow rate than the third left nasal prong.

178. The kit of parts of claim 169 or 170, the two or more nasal prong modules (408, 508, 608, 708) comprises a third nasal prong module (408, 508, 608, 708) and/or a fourth nasal prong module (408, 508, 608, 708), wherein:

the third nasal prong module (408, 508, 608, 708) forms a first symmetric nasal prong geometry;

the fourth nasal prong module (408, 508, 608, 708) forms a second symmetric nasal prong geometry;

nasal prongs of the first symmetric nasal prong geometry form a mirror-image of each other;

nasal prongs of the second symmetric nasal prong geometry form a mirror-image of each other;

the nasal prongs of the first symmetric nasal prong geometry are different from those of the second symmetric nasal prong geometry in one or more aspects, such as internal or external transverse dimension or cross-sectional area of the respective nasal prongs.

179. A nasal cannula (304, 400) for use in a respiratory support system (100, 200) arranged to deliver a flow of respiratory gases to an upper airway of a patient, the nasal cannula (304, 400) comprising:

a frame (402);

a coupling member (404) arranged to be operatively coupled to the frame (402) in a first operational configuration of the nasal cannula and a second operational configuration of the nasal cannula,

any one or both of the coupling member (404) and the frame (402) being arranged to be rotatable with respect to one another between the first operational configuration of the nasal cannula and the second operational configuration of the nasal cannula.

180. The nasal cannula (304, 400) of claim 179, wherein the coupling member (404) is arranged to rotate relative to the frame (402), optionally about a common axis (431).

181. The nasal cannula (304, 400) of claim 179 or 180, wherein each of the frame (402) and the coupling member (404) are arranged to rotate, for example with respect to each other, about a common axis (431).

182. The nasal cannula (304, 400) of claim 180 or 181, wherein the common axis (431) is centrally located on any one or both of the frame (402) and the coupling member (404).

183. The nasal cannula (304, 400) of any one of claims 180 to 182, wherein the common axis (431) is positioned at a coupling position of the frame (402) and the coupling member (404).

184. The nasal cannula (304, 400) of any one of claims 180 to 183, wherein the frame (402) and the coupling member (404) are arranged to pivot or rotate approximately 180° with respect to each other between the first operational configuration and the second operational configuration.

185. The nasal cannula (304, 400) of any one of claims 179 to 184, wherein the first operational configuration is a mirror image of the second operational configuration.

186. The nasal cannula (304, 400) of any one of claims 179 to 184, wherein:

in the first operational configuration, a first inlet opening (461a) of the frame (402) is coupled to a first gas outlet (451a) of the coupling member (404) and a second

inlet opening (461b) of the frame (402) is coupled to a second gas outlet (451b) of the coupling member (404); and

in the second operational configuration, the first inlet opening (461a) of the frame (402) is coupled to the second gas outlet (451b) of the coupling member (404) and the second inlet opening (461b) of the frame (402) is coupled to the first gas outlet (451a) of the coupling member (404).

187. The nasal cannula (304, 400) of any one of claims 179 to 186, wherein the coupling member (404) comprises a first end comprising a gas inlet, the gas inlet being arranged to be coupled to an inlet conduit (302) and receive the flow of respiratory gases from the inlet conduit (302).

188. The nasal cannula (304, 400) of claim 187, wherein the coupling member (404) comprises a second end that is opposite to the first end, the second end being closed.

189. The nasal cannula (304, 400) of any one of claims 179 to 185, wherein the nasal cannula (304, 400) is arranged to move into or move out of the first operational configuration or the second operational configuration when:

the position of the frame (402) is fixed and a force is applied to the coupling member (404); or

the position of the coupling member (404) is fixed and a force is applied to the frame (402); or

a first force is applied to the frame (402) and a second force is applied to the coupling member (404), the direction of the first force being opposite to the direction of the second force.

190. The nasal cannula (304, 400) of any one of claims 179 to 189, comprising a retention mechanism.

191. The nasal cannula (304, 400) of claim 190, wherein the retention mechanism is arranged to removably or reversibly retain the frame (402) and coupling member (404) in any one of the first operational configuration and the second operational configuration.

192. The nasal cannula (304, 400) of claim 190 or 191, wherein the retention mechanism provides any one or more of:

visual feedback;

audio feedback; and

tactile feedback,

when the frame (402) and the coupling member (404) are moved into and/or out of the first operational configuration and the second operational configuration.

193. The nasal cannula (304, 400) of any one of claims 190 to 192, wherein:

the frame (402) comprises one or more securing members (432);

the coupling member (404) comprises one or more receiving portions (433);

the one or more securing members (432) and the one or more receiving portions (433) form at least a portion of the retention mechanism; and

the one or more securing members (432) are arranged to be reversibly or removably coupled to the one or more receiving portions (433) in any one of the first operational configuration and the second operational configuration.

194. The nasal cannula (304, 400) of claim 193, wherein the frame (402), e.g., the one or more securing members (432) are arranged to be coupled to, and decoupled from, the coupling member (404), e.g., the one or more receiving portions (433), in a bi-directional manner.

195. The nasal cannula (304, 400) of claim 193 or 194, wherein the one or more receiving portions (433) are spaced from gas outlet(s) (451) of the coupling member (404).

196. The nasal cannula (304, 400) of claim 195, wherein at least a portion of the frame (402) is arranged to be positioned in a space between the one or more receiving portions (433) and the gas outlet(s) (451) of the coupling member (404).

197. The nasal cannula (304, 400) of any one of claims 193 to 196, wherein each of the one or more receiving portions (433) comprises two protrusions (491) defining a receiving recess therebetween, each receiving recess being arranged to receive at least a portion of a respective securing member (432).

198. The nasal cannula (304, 400) of claim 197, the receiving recess comprises a curved configuration, and each of the one or more securing members (432) comprise a post, wherein the curved configuration of each receiving recess is arranged to cooperate with or correspond to a curved configuration of a corresponding post of the one or more securing members (432).

199. The nasal cannula (304, 400) of any one of claims 193 to 198, wherein:

when the nasal cannula (304, 400) is in the first operational configuration or the second operational configuration, the one or more securing members (432) and the one or more receiving portions (433) are arranged to:

be decoupled when urged by a force above a first threshold; and

remain coupled in the absence of a force that is above the first threshold, and

when the nasal cannula (304, 400) is in the first operational configuration or the second operational configuration, the one or more securing members (432) and the one or more receiving portions (433) are arranged to:

be coupled when urged by a force above a second threshold; and

remain decoupled in the absence of force that is above the second threshold.

200. The nasal cannula (304, 400) of any one of claims 193 to 198, wherein:

the frame (402) and the coupling member (404) are moved into the first operational configuration or the second operational configuration when urged by a first force above a first threshold; and

the frame (402) and the coupling member (404) are moved out of the first operational configuration or the second operational configuration when urged by a second force above a second threshold,

wherein the first threshold and the second threshold are at least substantially the same.

201. The nasal cannula (304, 400) of claim 199, wherein the first threshold and the second threshold are at least substantially the same.

202. The nasal cannula (304, 400) of any one of claims 199 to 201, wherein the force is a rotational force.

203. The nasal cannula (304, 400) of any one of claims 193 to 202, wherein the one or more receiving portions (433) comprise a first receiving portion (433) and a second receiving portion (433).

204. The nasal cannula (304, 400) of any one of claims 193 to 203, wherein one or more securing members (432) comprise a first securing member (432) and a second securing member (432).

205. The nasal cannula (304, 400) of any one of claims 193 to 204, the one or more receiving portions (433) comprising a first receiving portion (433) and a second receiving portion (433), and the one or more securing members (432) comprising a first securing member (432) and a second securing member (432), wherein:

in the first operational configuration, the first securing member (432) is arranged to be coupled with the first receiving portion (433) and the second securing member (432) is arranged to be coupled with the second receiving portion (433); and

in the second operational configuration, the first securing member (432) is arranged to be coupled with the second receiving portion (433) and the second securing member (432) is arranged to be coupled with the first receiving portion (433).

206. The nasal cannula (304, 400) of any one of claims 179 to 205, wherein the frame (402) is more flexible or compliant than the coupling member (404).

207. The nasal cannula (304, 400) of any one of claims 179 to 206, comprising a fastening mechanism that is arranged to limit or prohibit flexion or deformation of the frame (402) in any one of the first operational configuration and the second operational configuration.

208. The nasal cannula (304, 400) of claim 207, wherein:

the frame (402) comprises one or more blocking portions (434);

the coupling member (404) comprises one or more barrier portions (435);

the one or more blocking portions (434) and the one or more barrier portions (435) form at least a portion of the fastening mechanism; and

the one or more blocking portions (434) are arranged to abut or press against or engage the one or more barrier portions (435) in any one of the first operational configuration and the second operational configuration.

209. The nasal cannula (304, 400) of claim 208, wherein:

the one or more blocking portions (434) comprise a first blocking portion (434) and a second blocking portion (434); and

the one or more barrier portions (435) comprise a first barrier portion (435) and a second barrier portion (435).

210. The nasal cannula (304, 400) of claim 209, wherein:

in the first operational configuration, the first blocking portion (434) is arranged to engage or abut or press against the first barrier portion (435) and second blocking portion (434) is arranged to engage or abut or press against the second barrier portion (435); and

in the second operational configuration, the first blocking portion (434) is arranged to engage or abut or press against the second barrier portion (435) and second blocking portion (434) is arranged to engage or abut or press against the first barrier portion (435).

211. The nasal cannula (304, 400) of any one of claims 208 to 210, wherein the one or more blocking portions (434) comprise a surface that is at least substantially planar.

212. The nasal cannula (304, 400) of any one of claims 208 to 211, wherein the one or more barrier portions (435) comprise a raised portion.

213. The nasal cannula (304, 400) of any one of claims 179 to 212, wherein the coupling member (404) comprises:

a main body (436);

a first extension (437) positioned at or proximate to a first end of the main body (436), the first extension (437) extending away from the main body (436); and

a second extension (437) positioned at or proximate to a second end of the main body (436), the second extension (437) extending away from the main body (436),

wherein the first end and the second end of the main body (436) are oppositely arranged.

214. The nasal cannula (304, 400) of claim 213, wherein at least a portion of the coupling member (404), e.g., the main body (436) of the coupling member (404), is tapered.

215. The nasal cannula (304, 400) of claim 214, wherein the coupling member (404), e.g., the main body (436) of the coupling member (404), comprises a larger cross-sectional area at a first end than a second end.

216. The nasal cannula (304, 400) of claim 215, wherein a rate of reduction in cross-sectional area is at least substantially constant from a first point to a second point, first point being positioned closer to the first end.

217. The nasal cannula (304, 400) of claim 216, wherein:

the first point is positioned at or proximate to the first end of the main body (436); and/or

the second point is positioned at or proximate to the second end of the main body (436).

218. The nasal cannula (304, 400) of any one of claims 215 to 217, wherein the first end is arranged to be coupled to an inlet conduit (302).

219. The nasal cannula (304, 400) of any one of claims 215 to 217, wherein:

the first end comprises a gas inlet that is arranged to be coupled to an inlet conduit (302); and

the second end is closed.

220. The nasal cannula (304, 400) of claim 218 or 219, wherein the first end is arranged to be coupled to the inlet conduit (302) via a coupling member connector (405).

221. The nasal cannula (304, 400) of any one of claims 213 to 220, wherein the coupling member (404), e.g., the main body (436) of the coupling member (404), comprises at least one dipped region (438) arranged to accommodate a septum of the patient.

222. The nasal cannula (304, 400) of claim 221, wherein the main body (436) comprises a first longitudinal side and a second longitudinal side opposite the first longitudinal side, the first longitudinal side comprising a first dipped region (438) and the second longitudinal side comprising a second dipped region (438).

223. The nasal cannula (304, 400) of claim 222, wherein:

the first dipped region (438) is arranged to accommodate the septum of the patient in the first operational configuration; and

the second dipped region (438) is arranged to accommodate the septum of the patient in the second operational configuration.

224. The nasal cannula (304, 400) of any one of claims 179 to 223, wherein:

the frame (402) comprises one or more first sealing members and the coupling member (404) comprises one or more second sealing members;

the one or more first sealing members and the one or more second sealing members are arranged to cooperate with each other in any one of the first operational configuration and the second operational configuration, to provide a gas flow path

between the coupling member (404) and the frame (402) that is at least substantially sealed from ambient air.

225. The nasal cannula (304, 400) of claim 224, wherein the one or more first sealing members and the one or more second sealing members are arranged to provide a groove (424) and tongue (423) sealing arrangement.

226. The nasal cannula (304, 400) of claim 224 or 225, wherein:

the one or more first sealing members comprise a first tongue (423) and a second tongue (423);

the one or more second sealing members comprise a first groove (424) and a second groove (424);

in the first operational configuration, the first groove (424) is arranged to receive and at least substantially seal against the first tongue (423) and the second groove (424) is arranged to receive and at least substantially seal against the second tongue (423); and

in the second operational configuration, the first groove (424) is arranged to receive and at least substantially seal against the second tongue (423) and the second groove (424) is arranged to receive and at least substantially seal against the first tongue (423).

227. The nasal cannula (304, 400) of claim 226, wherein:

the first tongue (423) is provided around or proximate to a first inlet opening (461a) of the frame (402);

the second tongue (423) is provided around or proximate to a second inlet opening (461b) of the frame (402);

the first groove (424) is provided around or proximate to a first gas outlet (451a) of the coupling member (404); and

the second groove (424) is provided around or proximate to a second gas outlet (451b) of the coupling member (404).

228. The nasal cannula (304, 400) of any one of claims 179 to 227, wherein the frame (402) and the coupling member (404) are coupled by a pin (412).

229. A frame (402) for a nasal cannula for use in a respiratory support system (100, 200) arranged to deliver a flow of respiratory gases to an upper airway of a patient, the frame (402) comprising:

a central portion (439);

a first side arm (407a) attached to a first end of the central portion (439) via a first connecting region (4071a), the first connecting region (4071a) comprising a smaller thickness and/or width in comparison to the central portion (439) and the first side arm (407a); and

a second side arm (407b) attached to a second end of the central portion (439) via a second connecting region (4071b), the second connecting region (4071b) comprising a smaller thickness and/or width in comparison to the central portion (439) and the second side arm (407b).

230. The frame (402) of claim 229, wherein the first connecting region (4071a) and the second connecting region (4071b) are each arranged to flex in multiple directions.

231. The frame (402) of claim 229 or 230, comprising a first pivoting or flexing axis (4072a) at or proximate to the first connecting region (4071a) and a second pivoting or flexing axis (4072b) at or proximate to the second connecting region (4071b), wherein the first side arm (407a) is arranged to pivot or flex about the first pivoting or flexing axis (4072a) and the second side arm (407b) is arranged to pivot or flex about the second pivoting or flexing axis (4072b).

232. The frame (402) of claim 231, wherein the first side arm (407a) and the second side arm (407b) are each arranged to pivot or flex towards and away from a posterior surface (445a) of the central portion (439).

233. The frame (402) of any one of claims 229 to 232, wherein the first connecting region (4071a) and the second connecting region (4071b) are each arranged to be more flexible than the central portion (439), the first side arm (407a), and the second side arm (407b).

234. The frame (402) of any one of claims 229 to 233, wherein:

the first side arm (407a) comprises a first overmolded portion and the second side arm (407b) comprises a second overmolded portion; and

the first overmolded portion and the second overmolded portion are made of a material that is softer than that of the central portion (439), the first connecting region (4071a), and/or the second connecting region (4071b).

235. A nasal cannula (304, 400) for use in a respiratory support system (100, 200) arranged to deliver a flow of respiratory gases to an upper airway of a patient, the nasal cannula system comprising the frame (402) of any one of claims 229 to 233.

236. The nasal cannula (304, 400) of claim 235, further comprising the nasal prong module (408, 508, 608, 708) of any one of claims 55 to 164, wherein the nasal prong module (408, 508, 608, 708) is arranged to be removably coupled to the frame (402).

237. The nasal cannula (304, 400) of claim 235 or 236, comprising a coupling member (404) for receiving the flow of respiratory gases for supply to or through the frame (402), the coupling member (404) arranged to be rotatably coupled with the frame (402).

238. A nasal cannula assembly (150) comprising:

the nasal cannula (304, 400) of any one of claims 179-227 or 235-237;

at least one inlet conduit (302) arranged to be coupled with any one or both of the coupling member (404) and the frame (402), and to receive the flow of respiratory gases for supply to the coupling member (404) and/or the frame (402); and

a headgear (306) arranged to be removably and/or adjustably coupled with the frame (402) and to extend around a rear of a head of the patient to secure the frame (402) in position on the head.

239. The nasal cannula assembly (150) of claim 238, wherein each of the at least one inlet conduit (302) comprises a tubing (312) that is at least partially formed from a breathable material.

240. The nasal cannula assembly (150) of any one of claims 235 to 239, comprising a nasal prong module (408, 508, 608, 708) configured to be removably coupled with the frame (402).

241. A method of configuring a nasal cannula assembly (150) for use in a respiratory support system (100, 200), the respiratory support system (100, 200) arranged to deliver a flow of respiratory gases to an upper airway of a patient, the method comprising:

selecting a nasal prong module (408, 508, 608, 708) among a plurality of nasal prong modules (408, 508, 608, 708) with different nasal prong geometries; and

removably coupling the selected nasal prong module (408, 508, 608, 708) with a frame (402) of the nasal cannula assembly (150).

242. The method of claim 241, wherein the plurality of nasal prong module (408, 508, 608, 708)s comprises one or more nasal prong modules (408, 508, 608, 708) comprising an asymmetric nasal prong geometry.

243. The method of claim 241 or 242, wherein selecting the nasal prong module (408, 508, 608, 708) comprises selecting from the plurality of nasal prong modules (408, 508, 608, 708) a first nasal prong module (408, 508, 608, 708).

244. The method of claim 243 comprising substituting the first nasal prong module (408, 508, 608, 708) for a second nasal prong module (408, 508, 608, 708) by decoupling the first nasal prong module (408, 508, 608, 708) from the frame (402) and removably coupling the second nasal prong module (408, 508, 608, 708) to the frame (402).

245. The method of claim 244, wherein the first nasal prong module (408, 508, 608, 708) comprises:

- a first nasal prong (406a, 506a, 606a, 706a) arranged to extend into a left nostril of the patient and form a first left nasal prong (406a, 506a, 606a, 706a); and

- a second nasal prong (406b, 506b, 606b, 706b) arranged to extend into a right nostril of the patient and form a first right nasal prong (406b, 506b, 606b, 706b), the first nasal prong geometry being or forming a left asymmetric nasal prong geometry such that:

- an internal transverse dimension or cross-sectional area of the first left nasal prong (406a, 506a, 606a, 706a) is greater than a corresponding internal transverse dimension or cross-sectional area of the first right nasal prong (406b, 506b, 606b, 706b); and/or

- an external transverse dimension or cross-sectional area of the first left nasal prong (406a, 506a, 606a, 706a) is greater than a corresponding external transverse dimension or cross-sectional area of the first right nasal prong (406b, 506b, 606b, 706b), wherein the first left nasal prong (406a, 506a, 606a, 706a) is arranged to provide a greater volumetric flow rate than the first right nasal prong (406b, 506b, 606b, 706b).

246. The method of claim 245, wherein the second nasal prong module (408, 508, 608, 708) comprises:

- a first nasal prong (406a, 506a, 606a, 706a) arranged to extend into a left nostril of the patient and form a second left nasal prong (406a, 506a, 606a, 706a); and

- a second nasal prong (406b, 506b, 606b, 706b) arranged to extend into a right nostril of the patient and form a second right nasal prong (406b, 506b, 606b, 706b),

the second nasal prong geometry being or forming a left asymmetric nasal prong geometry such that:

an internal transverse dimension or cross-sectional area of the second left nasal prong (406a, 506a, 606a, 706a) is greater than a corresponding internal transverse dimension or cross-sectional area of the second right nasal prong (406b, 506b, 606b, 706b); and/or

an external transverse dimension or cross-sectional area of the first second nasal prong (406b, 506b, 606b, 706b) is greater than a corresponding external transverse dimension or cross-sectional area of the second right nasal prong (406b, 506b, 606b, 706b), wherein the second left nasal prong (406a, 506a, 606a, 706a) is arranged to provide a greater volumetric flow rate than the second right nasal prong (406b, 506b, 606b, 706b).

247. The method of claim 246, wherein:

the internal transverse dimension or cross-sectional area of the first left nasal prong (406a, 506a, 606a, 706a) is greater than the internal transverse dimension or cross-sectional area of the second left nasal prong (406a, 506a, 606a, 706a); and/or

the external transverse dimension or cross-sectional area of the first left nasal prong (406a, 506a, 606a, 706a) is greater than the external transverse dimension or cross-sectional area of the second left nasal prong (406a, 506a, 606a, 706a).

248. The method of claim 247, wherein:

the internal transverse dimension or cross-sectional area of the first right nasal prong (406b, 506b, 606b, 706b) is greater than the internal transverse dimension or cross-sectional area of the second right nasal prong (406b, 506b, 606b, 706b); and/or

the external transverse dimension or cross-sectional area of the first right nasal prong (406b, 506b, 606b, 706b) is greater than the external transverse dimension or cross-sectional area of the second right nasal prong (406b, 506b, 606b, 706b).

249. The method of any one of claims 241 to 248, wherein selecting the nasal prong module (408, 508, 608, 708) comprises selecting between any two or more of:

a first nasal prong module (408, 508, 608, 708) comprising a left asymmetric nasal prong geometry,

a second nasal prong module (408, 508, 608, 708) comprising a right asymmetric nasal prong geometry,

a third nasal prong module (408, 508, 608, 708) comprising a symmetric nasal prong geometry, and/or

a fourth nasal prong module (408, 508, 608, 708) comprising a symmetric nasal prong geometry different to that of the third nasal prong module (408, 508, 608, 708).

250. The method of any one of claims 241 to 249, comprising:

selecting a type or variant of therapy for the patient from among a plurality of different types or variants of therapy; and

selecting the nasal prong module (408, 508, 608, 708) based, at least in part, on the selected type or variant of therapy.

251. The method of claim 250, wherein the plurality of different types or variants of therapy comprise an asymmetric nasal high flow therapy and a symmetric nasal high flow therapy.

252. The method of claim 250 or 251, wherein the plurality of different types or variants of therapy comprise a left asymmetric nasal high flow therapy and a right asymmetric nasal high flow therapy.

253. The method of any one of claims 241 to 252, comprising:

selecting between a left side entry or a right side entry for the flow of respiratory gases into the nasal cannula assembly (150); and

configuring the nasal cannula assembly (150) for the left side entry or the right side entry.

254. The method of claim 253, wherein selecting between the left side entry and the right side entry is based, at least in part, on the selected nasal prong module (408, 508, 608, 708).

255. The method of claim 253, wherein selecting the nasal prong module (408, 508, 608, 708) is based, at least in part, on the selection between the left side entry and the right side entry.

256. The method of claim 253, wherein the selected nasal prong module (408, 508, 608, 708) comprises a pair of nasal prongs with an asymmetric nasal prong geometry, the method comprising configuring the nasal cannula assembly (150) so that a larger one of the pair of nasal prongs is downstream of a smaller one of the pair of nasal prongs.

257. The method of claim 254, wherein selecting between the left side entry and the right side entry comprises:

selecting the left side entry if the selected nasal prong module (408, 508, 608, 708) comprises a right asymmetric nasal prong geometry;

selecting the right side entry if the selected nasal prong module (408, 508, 608, 708) comprises a left asymmetric nasal prong geometry; or

selecting either of the left side entry or the right side entry if the selected nasal prong module (408, 508, 608, 708) comprises a symmetric nasal prong geometry.

258. The method of any one of claims 241 to 257, comprising removing an existing nasal prong module (408, 508, 608, 708) from the frame (402) of the nasal cannula assembly (150) before removably coupling the selected nasal prong module (408, 508, 608, 708) with the frame (402).

259. The method of claim 258, wherein the selected nasal prong module (408, 508, 608, 708) comprises a different nasal prong geometry to that of the existing nasal prong module (408, 508, 608, 708).

260. The method of claim 258 or 259, wherein the selected nasal prong module (408, 508, 608, 708) is arranged to provide a different type or variant of therapy than the existing nasal prong module (408, 508, 608, 708).

261. The method of any one of claims 241 to 260, the nasal cannula assembly (150) comprising a frame (402) and a coupling member (404), the method comprising reconfiguring the nasal cannula assembly (150) between a left side entry and a right side entry by rotating the coupling member (404) with respect to frame (402).

262. A method of reconfiguring a respiratory support system (100, 200), or a nasal cannula assembly (150) for use in the respiratory support system (100, 200), to provide a different variant of nasal high flow therapy to a patient, the respiratory support system (100, 200) arranged to deliver a flow of respiratory gases to an upper airway of the patient, the method comprising:

removing a first nasal prong module (408, 508, 608, 708) from a frame (402) of the nasal cannula assembly (150), the first nasal prong module (408, 508, 608, 708) comprising one or more of a first left nasal prong (406a, 506a, 606a, 706a) arranged to extend into a left nostril of the patient or a first right nasal prong (406b, 506b, 606b, 706b) arranged to extend into a right nostril of the patient, the first nasal prong module (408, 508, 608, 708) comprising a first nasal prong geometry; and

removably coupling a second nasal prong module (408, 508, 608, 708) with the frame (402) of the nasal cannula assembly (150), the second nasal prong module (408, 508, 608, 708) comprising one or more of a second left nasal prong (406a, 506a, 606a, 706a) arranged to extend into the left nostril of the patient or a second right nasal prong (406b, 506b, 606b, 706b) arranged to extend into the right nostril of the patient, the second nasal prong module (408, 508, 608, 708) comprising a second nasal prong (406b, 506b, 606b, 706b) geometry different to the first nasal prong geometry.

263. The method of claim 262, wherein:

the first nasal prong geometry forms one of a symmetric nasal prong geometry or an asymmetric nasal prong geometry; and

the second nasal prong geometry forms the other of the symmetric nasal prong geometry or the asymmetric nasal prong geometry.

264. The method of claim 262 or 263, wherein:

the first nasal prong module (408, 508, 608, 708) is arranged to provide one of a symmetric nasal high flow therapy or an asymmetric nasal high flow therapy; and

the second nasal prong module (408, 508, 608, 708) is arranged to provide the other of the symmetric nasal high flow therapy or the asymmetric nasal high flow therapy.

265. The method of any one of claims 262 to 264, comprising reconfiguring the respiratory support system (100, 200) or the nasal cannula assembly (150):

from a symmetric high flow respiratory support system (100, 200) or a symmetric high flow nasal cannula assembly (150) arranged to provide symmetric nasal high flow therapy, to an asymmetric high flow respiratory support system (100, 200) or an asymmetric high flow nasal cannula assembly (150) arranged to provide asymmetric nasal high flow therapy; or

from an asymmetric high flow respiratory support system (100, 200) or an asymmetric high flow nasal cannula assembly (150) arranged to provide asymmetric nasal high flow therapy, to a symmetric high flow respiratory support system (100, 200) or a symmetric high flow nasal cannula assembly (150) arranged to provide symmetric nasal high flow therapy.

266. The method of any one of claims 262 to 265, wherein the first nasal prong module (408, 508, 608, 708) is associated with a first therapy, the second nasal prong module (408, 508, 608, 708) associated with a second therapy, and removing the first nasal

prong module (408, 508, 608, 708) and removably coupling the second nasal prong module (408, 508, 608, 708) reconfigures the respiratory support system (100, 200) to provide the second therapy without requiring a change to any settings of a gases source (110) of the respiratory support system (100, 200).

267. The method of any one of claims 262 to 266, comprising reusing the frame (402) and any one or more of:

- a coupling member (404) of the nasal cannula assembly (150), the coupling member (404) arranged to be coupled with the frame (402);

- at least one inlet conduit (302) of the nasal cannula assembly (150), the inlet conduit (302) arranged to be coupled with the coupling member (404);

- at least one coupling member connector (405) of the nasal cannula assembly (150), the coupling member connector (405) arranged to couple the inlet conduit (302) with the coupling member (404);

- at least one swivel connector (308) of the nasal cannula assembly (150), the swivel connector (308) arranged to couple the inlet conduit (302) with an inspiratory conduit (140) of the respiratory support; or

- a headgear (306) of the nasal cannula assembly (150), the headgear (306) arranged to be removably and/or adjustably coupled with the frame (402) and to extend around a rear of a head of the patient to secure the frame (402) in position on the head.

268. The method of any one of claims 262 to 267, the nasal cannula assembly (150) comprising a frame (402) and a coupling member (404), the method comprising reconfiguring the nasal cannula assembly (150) between a left side entry and a right side entry by rotating the coupling member (404) with respect to the frame (402).

269. The method of claim 268, comprising rotating the coupling member (404) about an axis lying within a sagittal plane (S) of the nasal cannula assembly (150).

270. The method of claim 268, comprising rotating the coupling member (404) by 180°.

271. The method of any one of claims 268 to 270, comprising:

- reconfiguring the nasal cannula (304, 400) from the left side entry to the right side entry by rotating the coupling member (404) in a first direction, or

reconfiguring the nasal cannula (304, 400) from the right side entry to the left side entry by rotating the coupling member (404) in a second direction, wherein the second direction is opposite to the first direction.

272. A method of configuring a nasal cannula assembly (150) for use in a respiratory support system (100, 200), the respiratory support system (100, 200) arranged to deliver a flow of respiratory gases to an upper airway of the patient, the nasal cannula assembly (150) comprising a coupling member (404) configured to receive the flow of respiratory gases and supply the flow of respiratory gases to, or through, the frame (402) for delivery to the patient, the method comprising reconfiguring the nasal cannula assembly (150) between a first operational configuration, in which the coupling member (404) is arranged to receive the flow of respiratory gases from a first side of the nasal cannula assembly (150), and a second operational configuration, in which the coupling member (404) is arranged to receive the flow of respiratory gases from a second side of the nasal cannula assembly (150), by rotating the coupling member (404) with respect to the frame (402).

273. The method of claim 272, comprising rotating the coupling member (404) about an axis lying within a sagittal plane (S) of the nasal cannula assembly (150).

274. The method of claim 272 or 273, comprising rotating the coupling member (404) by 180 °.

275. The method of any one of claims 272 to 274, comprising:

reconfiguring the nasal cannula (304, 400) from the left side entry to the right side entry by rotating the coupling member (404) in a first direction, or

reconfiguring the nasal cannula (304, 400) from the right side entry to the left side entry by rotating the coupling member (404) in a second direction, wherein the second direction is opposite to the first direction.

276. The method of any one of claims 272 to 275, comprising selecting between the first operational configuration and the second operational configuration based, at least in part, upon a geometry of a pair of nasal prongs of the nasal cannula assembly (150).

277. A nasal cannula (304, 400) for use in a respiratory support system (100, 200) arranged to deliver a flow of respiratory gases to an upper airway of a patient, the nasal cannula (304, 400) comprising:

a frame (402);

a coupling member (404) arranged to be removably or permanently mechanically coupled with the frame (402), the coupling member (404) comprising a gas inlet configured to be mechanically and fluidly coupled with an inlet conduit (302) for receiving the flow of respiratory gases, a first gas outlet (451a) for supplying at least a portion of the received gas flow via or through the frame (402) to a first nasal prong (406a, 506a, 606a, 706a) and a second gas outlet (451b) for supplying at least a portion of the received gas flow via or through the frame (402) to a second nasal prong (406b, 506b, 606b, 706b).

278. The nasal cannula (304, 400) according to claim 277, wherein the gas inlet is the only gas inlet of the coupling member (404) and wherein the first and second gas outlets (451a, 451b) are the only gas outlets of the coupling member (404).

279. The nasal cannula (304, 400) according to claim 277 or 278, wherein the nasal cannula (304, 400) is arranged to mechanically couple the coupling member (404) to the frame (402) in a first operational configuration and in a second operational configuration, the second operational configuration optionally being a mirror image of the first operational configuration.

280. The nasal cannula (304, 400) according to claim 279, wherein the coupling member (404) and the frame (402) are rotationally coupled to rotate with respect to each other about a common axis (431) between the first operational configuration and the second operation configuration, the coupling member (404) and the frame (402) optionally being rotationally coupled via a swivel bearing.

281. The nasal cannula (304, 400) according to claim 280, wherein the common axis (431) is substantially normal to the face or head of a patient when the nasal cannula (304, 400) is fitted to the patient, the first and second gas outlets (451a, 451b) optionally extending substantially normal to the face or head of a patient when the nasal cannula (304, 400) is fitted to the patient.

282. The nasal cannula (304, 400) according to claim 280 or 281, wherein the common axis (431) is centrally located on any one or both of the frame (402) and the coupling member (404), the common axis (431) optionally being within a sagittal plane of a patient when the nasal cannula (304, 400) is fitted to the patient.

283. The nasal cannula (304, 400) according to any one of claims 280 to 282, wherein the common axis (431), the first gas outlet (451a) and the second gas outlet (451b) are spaced apart from each other.

284. The nasal cannula (304, 400) according to claim 283, wherein the first and second gas outlets (451a, 451b) are positioned on opposite sides of the common axis (431).

285. The nasal cannula (304, 400) according to any one of claims 279 to 284, further comprising a retention mechanism arranged to removably or reversibly retain the frame (402) and the coupling member (404) in any one of the first operational configuration and the second operational configuration.

286. The nasal cannula (304, 400) according to any one of claims 277 to 285, wherein the coupling member (404) is configured to redirect the gas flow from the gas inlet to the first and second gas outlets (451a, 451b) by more than 95 degrees, optionally more than 100 degrees, the gas inlet optionally being angled towards the head of a patient when the nasal cannula (304, 400) is fitted to the patient.

287. The nasal cannula (304, 400) according to any one of claims 277 to 286, wherein the frame (402) comprises a first inlet opening (461a) for being fluidically coupled with the first gas outlet (451a) of the coupling member (404) and a second inlet opening (461b) for being fluidically coupled with the second gas outlet (451b) of the coupling member (404).

288. The nasal cannula (304, 400) according to claim 279 and 287, wherein in the first operational configuration, the first inlet opening (461a) of the frame (402) is fluidically coupled to the first gas outlet (451a) of the coupling member (404) and the second inlet opening (461b) of the frame (402) is fluidically coupled to the second gas outlet (451b) of the coupling member (404), and wherein in the second operational configuration, the first inlet opening (461a) of the frame (402) is fluidically coupled to the second gas outlet (451b) of the coupling member (404) and the second inlet opening (461b) of the frame (402) is fluidically coupled to the first gas outlet (451a) of the coupling member (404).

289. The nasal cannula (304, 400) according to any one of claims 277 to 288, further comprising a headgear (306) arranged to be removably and/or adjustably coupled with the frame (402) and to extend around a rear of a head of the patient to secure the frame (402) in position on the head.

290. The nasal cannula (304, 400) according to any one of claims 277 to 289, further comprising the first nasal prong (406a, 506a, 606a, 706a) and the second nasal prong (406b, 506b, 606b, 706b).

291. The nasal cannula (304, 400) according to claim 290, wherein the nasal cannula (304, 400) is configured to deliver at least one of an asymmetric and a symmetric flow of respiratory gases to a patient at the first and the second nasal prongs.

292. The nasal cannula (304, 400) according to claim 290 or 291, wherein the nasal cannula (304, 400) forms an asymmetric nasal prong geometry, such that: an internal

transverse dimension or cross-sectional area of the first nasal prong (406a, 506a, 606a, 706a) is different to a corresponding internal transverse dimension or cross-sectional area of the second nasal prong (406b, 506b, 606b, 706b); and/or an external transverse dimension or cross-sectional area of the first nasal prong (406a, 506a, 606a, 706a) is different to a corresponding external transverse dimension or cross-sectional area of the second nasal prong (406b, 506b, 606b, 706b).

293. The nasal cannula (304, 400) according to any one of claims 290 to 292, further comprising a nasal prong module (408, 508, 608, 708) comprising the first nasal prong (406a, 506a, 606a, 706a) and the second nasal prong (406b, 506b, 606b, 706b), the nasal prong module (408, 508, 608, 708) comprising a first gases inlet aperture (450a) and a second gases inlet aperture (450b), wherein the first nasal prong (406a, 506a, 606a, 706a) is fluidly, such as pneumatically, coupled with the first gases inlet aperture (450a) and the second nasal prong (406b, 506b, 606b, 706b) is fluidly, such as pneumatically, coupled with the second gases inlet aperture (450b).

294. The nasal cannula (304, 400) according to claim 293, wherein the nasal prong module (408, 508, 608, 708) comprises a first gas carrying portion (460a, 560a, 660a, 760a) fluidly, such as pneumatically, coupled with the first gases inlet aperture (450a) and the first nasal prong (406a, 506a, 606a, 706a), and a second gas carrying portion (460b, 560b, 660b, 760b) fluidly, such as pneumatically, coupled with the second gases inlet aperture (450b) and the second nasal prong (406b, 506b, 606b, 706b), the first gas carrying portion (460a, 560a, 660a, 760a) and the second gas carrying portion (460b, 560b, 660b, 760b) being separate from each other.

295. The nasal cannula (304, 400) according to claim 293 or 294 when directly or indirectly dependent on claim 287, wherein the frame (402) comprises a first outlet opening (414a) fluidly coupled with the first inlet opening (461a) of the frame (402) and the first gases inlet aperture (450a) of the nasal prong module (408, 508, 608, 708) and a second outlet opening (414b) fluidly coupled with the second inlet opening (461b) of the frame (402) and the second gases inlet aperture (450b) of the nasal prong module (408, 508, 608, 708).

296. The nasal cannula (304, 400) according to any one of claims 293 to 295, wherein the nasal prong module (408, 508, 608, 708) is arranged to be removably coupled to the frame (402), wherein, optionally, the frame (402) and the nasal prong module (408, 508, 608, 708) are arranged to be removably coupled adjacent a posterior side of the frame (402) and wherein the frame (402) and the coupling member (404) are arranged to be removably or permanently coupled adjacent an anterior side of the frame (402).

297. A nasal cannula system comprising a nasal cannula (304, 400) with a first nasal prong module (408, 508, 608, 708) according to any one of claims 293 to 296 and a second nasal prong module (408, 508, 608, 708), the second nasal prong module (408, 508, 608, 708) comprising a first nasal prong (406a, 506a, 606a, 706a) and a second nasal prong (406b, 506b, 606b, 706b), wherein the first and the second nasal prongs of the first nasal prong module (408, 508, 608, 708) form a first nasal prong geometry and the first and the second nasal prong (406b, 506b, 606b, 706b)s of the second nasal prong module (408, 508, 608, 708) form a second nasal prong (406b, 506b, 606b, 706b) geometry, the first nasal prong geometry being different from the second nasal prong geometry.

298. A nasal prong module (408, 508, 608, 708) for use in a nasal cannula (304, 400) of a respiratory support system (100, 200) arranged to deliver a flow of respiratory gases to an upper airway of a patient, the nasal prong module (408, 508, 608, 708) comprising:

- a base portion (420, 520, 620, 720) comprising one or more coupling structures (480) arranged to removably engage and/or cooperate with one or more corresponding attachment structures (490) of a frame (402) of the nasal cannula, the frame (402) arranged to support the nasal prong module (408, 508, 608, 708) in position, e.g., at an upper lip region of the patient;

- a body portion (440, 540, 640, 740) coupled or integrally formed with the base portion (420, 520, 620, 720); and

- any one or both of:

- a first nasal prong (406a, 506a, 606a, 706a) coupled with and extending from the body portion (440, 540, 640, 740); and

- a second nasal prong (406b, 506b, 606b, 706b) coupled with and extending from the body portion (440, 540, 640, 740),

- wherein the body portion (440, 540, 640, 740) is arranged to receive the flow of respiratory gases for delivery to the upper airway of the patient via any one or both of the first nasal prong (406a, 506a, 606a, 706a) and the second nasal prong (406b, 506b, 606b, 706b); and

- wherein the one or more coupling structures (480) of the base portion (420, 520, 620, 720) are arranged to removably torque-proofly couple the base portion (420, 520, 620, 720) to the frame (402) by moving the base portion (420, 520, 620, 720) and the

frame (402) towards each other in at least one of the anterior direction and the posterior direction.

299. The nasal prong module (408, 508, 608, 708) of claim 298, wherein the one or more coupling structures (480) of the base portion (420, 520, 620, 720) are arranged to be removably coupled with the one or more corresponding attachment structures (490) of the frame (402) in a removable snap fit, the snap fit, optionally, being arranged to provide any one or more of: tactile feedback, audible feedback, and visual feedback.

300. The nasal prong module (408, 508, 608, 708) of claim 298 or 299, wherein the one or more coupling structures (480) are arranged to resiliently deflect and at least partially recover as the base portion (420, 520, 620, 720) is coupled with the frame (402).

301. The nasal prong module (408, 508, 608, 708) of any one of claims 298 to 300, wherein the one or more coupling structures (480) project in an anterior direction, away from the body portion (440, 540, 640, 740), and are, optionally, each bisected by a sagittal plane (S) of the nasal prong module (408, 508, 608, 708).

302. The nasal prong module (408, 508, 608, 708) of any one of claims 298 to 301, wherein each of the one or more coupling structures (480) comprises a protrusion (491) arranged to engage or mate with a recess or underside portion of the respective one or more attachment structures (490) of the frame (402), wherein the protrusions (491) are, optionally, located on inward surfaces at or proximate distal ends of the one or more coupling structures (480).

303. The nasal prong module (408, 508, 608, 708) of any one of claims 298 to 302, wherein the base portion (420, 520, 620, 720) is arranged to couple with the frame (402) in only a single orientation, wherein, optionally, at least one of the coupling structures (480) comprises at least one slot (481) arranged to cooperate with at least one corresponding protrusion (491) of the frame (402).

304. The nasal prong module (408, 508, 608, 708) of any one of claims 298 to 303, wherein the base portion (420, 520, 620, 720) comprises a pair of coupling structures (480) arranged to cooperate with a corresponding pair of attachment structures (490) of the frame (402), wherein, optionally, the pair of coupling structures (480) are located in an opposing relationship.

305. The nasal prong module (408, 508, 608, 708) of claim 304, the pair of coupling structures (480) comprising a first coupling structure and a second coupling structure, the first coupling structure comprising a first coupling structure geometry and the second coupling structure comprising a second coupling structure geometry different to

the first coupling structure geometry, wherein, optionally, the first coupling structure is wider than the second coupling structure.

306. The nasal prong module (408, 508, 608, 708) of any one of claims 298 to 305, the base portion (420, 520, 620, 720) comprising a first gases inlet aperture (450a) and a second gases inlet aperture (450b) arranged to receive the flow of respiratory gases for supply to the body portion (440, 540, 640, 740) and any one or both of the first nasal prong (406a, 506a, 606a, 706a) and the second nasal prong (406b, 506b, 606b, 706b), wherein the first nasal prong (406a, 506a, 606a, 706a) is fluidly, such as pneumatically, coupled with the first gases inlet aperture (450a) and the second nasal prong (406b, 506b, 606b, 706b) is fluidly, such as pneumatically, coupled with the second gases inlet aperture (450b).

307. The nasal prong module (408, 508, 608, 708) of claim 306, wherein the body portion (440, 540, 640, 740) comprises a first gas carrying portion (460a, 560a, 660a, 760a) fluidly, such as pneumatically, coupled with the first gases inlet aperture (450a) and the first nasal prong (406a, 506a, 606a, 706a), and a second gas carrying portion (460b, 560b, 660b, 760b) fluidly, such as pneumatically, coupled with the second gases inlet aperture (450b) and the second nasal prong (406b, 506b, 606b, 706b), the first gas carrying portion (460a, 560a, 660a, 760a) and the second gas carrying portion (460b, 560b, 660b, 760b) being separate from each other.

308. A frame (402) for a nasal cannula for use in a respiratory support system (100, 200) arranged to deliver a flow of respiratory gases to an upper airway of a patient, the frame (402) being arranged to support a nasal prong module (408, 508, 608, 708) in position, optionally a nasal prong module (408, 508, 608, 708) according to any one of claims 298 to 307, comprising:

one or more attachment structures (490) arranged to removably engage and/or cooperate with one or more corresponding coupling structures (480) of the nasal prong module (408, 508, 608, 708);

wherein the one or more attachment structures (490) are arranged to removably torque-proofly couple the frame (402) to the nasal prong module (408, 508, 608, 708) by moving the nasal prong module (408, 508, 608, 708) and the frame (402) towards each other in at least one of the anterior direction and the posterior direction; and

an outlet opening (414) arranged to fluidly, such as pneumatically, couple with a gases inlet aperture (450) of the nasal prong module (408, 508, 608, 708) for delivery of the flow of respiratory gases to the upper airway of the patient via the nasal prong module (408, 508, 608, 708).

309. The frame (402) of claim 308, wherein the one or more attachment structures (490) are arranged to be removably coupled with the one or more corresponding coupling structures (480) of the nasal prong module (408, 508, 608, 708) in a removable snap fit, the snap fit, optionally, being arranged to provide any one or more of: tactile feedback, audible feedback, and visual feedback.

310. The frame (402) of claim 308 or 309, wherein each of the one or more attachment structures (490) comprises a recess or underside portion arranged to engage or mate with a protrusion (491) of the respective one or more coupling structures (480) of the nasal prong module (408, 508, 608, 708).

311. The frame (402) of any one of claims 308 to 310, wherein the frame (402) is arranged to couple with the nasal prong module (408, 508, 608, 708) in only a single orientation, wherein, optionally, the frame (402) comprises a protrusion (491) arranged to cooperate with a slot (481) of at least one of the coupling structures (480) of the nasal prong module (408, 508, 608, 708).

312. The frame (402) of any one of claims 308 to 311, wherein the frame (402) comprises a pair of attachment structures (490) arranged to cooperate with a corresponding pair of coupling structures (480) of the nasal prong module (408, 508, 608, 708), wherein, optionally, the pair of attachment structures (490) are located in an opposing relationship.

313. The frame (402) of claim 312, the pair of attachment structures (490) comprising a first attachment structure and a second attachment structure, the first attachment structure comprising a first attachment structure geometry and the second attachment structure comprising a second attachment structure geometry different to the first attachment structure geometry, wherein, optionally, the first attachment structure is wider than the second attachment structure.

314. The frame (402) of any one of claims 308 to 313, the frame (402) comprising a first outlet opening (414a) arranged to fluidly, such as pneumatically, couple with a first gases inlet aperture (450a) of the nasal prong module (408, 508, 608, 708) and second outlet opening (414b) arranged to fluidly, such as pneumatically, couple with a second gases inlet aperture (450b) of the nasal prong module (408, 508, 608, 708).

315. The frame (402) of any one of claims 308 to 314, further comprising a headgear (306) arranged to be removably and/or adjustably coupled with the frame (402) and to extend around a rear of a head of the patient to secure the frame (402) in position on the head.

316. A nasal cannula (304, 400) comprising a frame (402) according to any one of claims 308 to 315 and a coupling member (404) arranged to be removably or permanently mechanically coupled with the frame (402), the coupling member (404) comprising a gas inlet configured to be mechanically and fluidly coupled with an inlet conduit (302) for receiving the flow of respiratory gases and a gas outlet opening for supplying at least a portion of the received gas flow to an inlet opening (461) of the frame (402), which is fluidly, such as pneumatically, coupled with the outlet opening (414) of the frame (402).

317. The nasal cannula (304, 400) of claim 316, wherein the coupling member (404) comprises a first gas outlet (451a) for supplying at least a portion of the received gas flow to a first inlet opening (461a) of the frame (402), which is fluidly, such as pneumatically, coupled with first outlet opening (414a) of the frame (402), and a second gas outlet (451b) for supplying at least a portion of the received gas flow to a second inlet opening (461b) of the frame (402), which is fluidly, such as pneumatically, coupled with the second outlet opening (414b) of the frame (402).

318. A kit of parts for a nasal cannula assembly (150), the kit of parts comprising:

a nasal prong module (408, 508, 608, 708) according to any one of claims 298 to 307; and

a frame (402) according to any one of claims 308 to 315 or a nasal cannula (304, 400) according to one of claim 316 and 317.