CLAIMS

1. A respiratory system comprising a dual outlet blower, wherein one of a first and a second outlet of the blower provides a flow of gases to one of a pair of pneumatically separated nasal outlets of a nasal interface and the other one of the first and second outlets provides a flow of gases to the other one of the pair of nasal outlets of the nasal interface, or wherein one of the first and second outlets provides a flow of gases to a nasal outlet of an oro-nasal interface and the other one of the first and second outlets provides a flow of gases to an oral outlet of the oro-nasal interface, and wherein the blower comprises an impeller, and a housing comprising an impeller chamber in which the impeller rotates, and
with rotation of the impeller in a first direction of rotation, a flow of gases from the first outlet is greater than a flow of gases from the second outlet, and
with rotation of the impeller in a second direction of rotation, a flow of gases from the second outlet is greater than a flow of gases from the first outlet.

2. A respiratory system as claimed in claim 1, wherein the housing comprises the first outlet and the second outlet, the first outlet arranged to direct a flow of gases from the housing when the impeller rotates in the first direction of rotation, and the second outlet arranged to direct a flow of gases from the housing when the impeller rotates in the second direction of rotation and the second direction of rotation is opposite to the first direction of rotation.

3. A respiratory system as claimed in any one of claims 1 or 2, wherein:

rotation of the impeller in the first direction of rotation generates a first flow of gases from the first outlet and a second flow of gases from the second outlet, and

rotation of the impeller in the second direction of rotation, which is opposite the first direction of rotation generates the first flow of gases or a third flow of gases from the second outlet and the second flow of gases or a fourth flow of gases from the first outlet, and

the flow rate of the first flow of gases is greater than the flow rate of the second flow of gases, and the flow rate of the third flow of gases is greater than the flow rate of the fourth flow of gases.

4. A respiratory system as claimed in any one of claims 1 to 3, wherein the

flowrate of the first flow of gases is substantially the same as the flowrate of the third flow of gases.

5. A respiratory system as claimed in any one of claims 2 to 4, wherein the blower comprises a motor for driving rotation of the impeller, and the housing comprises the impeller chamber and a motor chamber for supporting the motor within the housing.

6. A respiratory system as claimed in any one of claims 1 to 5, wherein the blower comprises a first impeller and a second impeller, and the housing comprises a first impeller chamber in which the first impeller rotates and a second impeller chamber in which the second impeller rotates, and

wherein the first and second impellers are rotationally coupled to rotate together, the first impeller for generating a flow of gases from the first outlet when the first and second impellers rotate in the first direction of rotation, and the second impeller for generating a flow of gases from the second outlet when the first and second impellers rotate in the second direction of rotation.

7. A respiratory system as claimed in claim 6, wherein the blower comprises a motor for driving rotation of the first and second impellers, the motor comprising a rotor and a stator, wherein the first and second impellers are rotationally coupled to the rotor.

8. A respiratory system as claimed in claim 7, wherein the rotor is positioned axially between the first and second impellers, and

wherein the housing comprises a motor chamber for the motor located axially between the first and second impeller chambers.

9. A respiratory system as claimed in any one of claims 2 to 8, wherein the impeller is a centrifugal impeller.

10. A respiratory system as claimed in claim 9, wherein the housing comprises a volute chamber receiving a flow of gases from the impeller chamber.

11. A respiratory system as claimed in any one of the preceding claims, wherein the first outlet extends substantially tangentially from the housing with respect to a first direction of rotation of the impeller, and the second outlet extends

substantially tangentially from the housing with respect to an opposite second direction of rotation of the impeller.

12. A respiratory system as claimed in any one of claims 9 to 11 when dependent on claim 6, wherein the volute chamber receives a flow of gases from the first and second impeller chambers.

13. A respiratory system as claimed in any one of claims 9 to 11 when dependent on claim 6, wherein the housing comprises:

a first volute chamber to receive a flow of gases from the first impeller chamber, the first outlet arranged to direct the first flow of gases from the first volute chamber, and

a second volute chamber to receive a flow of gases from the second impeller chamber, the second outlet arranged to direct the second flow of gases from the second volute chamber.

14. A respiratory system as claimed in claim 9, wherein the first and second outlets are axial outlets.

15. A respiratory system as claimed in claim 14, wherein the first outlet is an axial outlet at a first side of the blower and the second outlet is an axial outlet at a second side of the blower.

16. A respiratory system as claimed in claim 14 or 15, wherein the housing comprises a first stator ring and a second stator ring, each stator ring comprising a plurality of volute paths, the first axial outlet comprising the volute paths of the first stator ring, and the second axial outlet comprising the volute paths of the second stator ring.

17. A respiratory system as claimed in claim 16, wherein each stator ring comprises a plurality of curved vanes, each said volute path separated from an adjacent volute path in the stator ring by a said curved vane.

18. A respiratory system as claimed in claim 17, wherein each stator ring comprises the plurality of curved vanes spaced circumferentially apart radially outside of or adjacent to or at the radial outer perimeter of the impeller or a respective one of a first impeller and a second impeller.

19. A respiratory system as claimed in claim 1, wherein the housing comprises the first outlet and the second outlet, wherein:

rotation of the impeller in the first direction of rotation generates a first flow of gases from the first outlet and a second flow of gases from the second outlet, and

rotation of the impeller in the second direction of rotation, which is opposite to the first direction of rotation, generates the first flow of gases or a third flow of gases from the second outlet and the second flow of gases or a fourth flow of gases from the first outlet, and

the flow rate of the first flow of gases is greater than the flow rate of the second flow of gases, and the flow rate of the third flow of gases is greater than the flow rate of the fourth flow of gases.

20. A respiratory system as claimed in claim 1, wherein the housing comprising the first outlet and the second outlet, the first outlet extending substantially tangentially from the housing with respect to the first direction of rotation of the impeller, and the second outlet extending substantially tangentially from the housing with respect to the second direction of rotation of the impeller, which is opposite to the first direction of rotation.

21. A respiratory system as claimed in any one of claims 1 to 20, comprising:

the nasal interface comprising a first nasal outlet for providing a flow of respiratory gases to a user via one of the user's nares, and a second nasal outlet for providing a flow of respiratory gases to the user via the other one of the user's nares, wherein the first outlet of the blower is in fluid communication with the first nasal outlet of the nasal interface, and the second outlet of the blower is in fluid communication with the second nasal outlet of the nasal interface,

wherein rotation of an impeller of the blower in a first direction of rotation generates a flow of gases to the first nasal outlet of the nasal interface, and rotation of the impeller in a second direction of rotation generates a flow of gases to the second nasal outlet of the nasal interface.

22. A respiratory system as claimed in claim 21, comprising a sensing arrangement to determine occlusion of one of the nares of the user and a controller to control the direction of rotation of the impeller in response,

wherein if the sensing arrangement detects one of the user's nares is at least partially occluded, the sensing arrangement causes the impeller to rotate in

one of the first and second directions of rotation to generate a flow to the other one of the user's nares, and vice versa.

23. A respiratory system as claimed in claim 22 wherein the sensing arrangement comprises a pressure or flow sensor to detect a pressure or flow to or at the user's nares to determine if one or other of the user's nares is at least partially occluded.

24. A respiratory system as claimed in claim 23, wherein the sensing arrangement comprises:

a first pressure or flow sensor to detect a pressure or flow to or at one of the user's nares to determine if the one of the user's nares is at least partially occluded, and

a second pressure or flow sensor to detect a pressure or flow to or at the other one of the user's nares to determine if the other one of the user's nares is at least partially occluded.

25. A respiratory system as claimed in any one of claims 1 to 20, comprising:

the oro-nasal interface comprising the nasal outlet for providing a flow of respiratory gases to a user via at least one of the user's nares, and the oral outlet for providing a flow of respiratory gases to the user via the user's mouth, and

wherein the first outlet of the blower housing is in fluid communication with the nasal outlet of the oro-nasal interface, and the second outlet of the blower housing is in fluid communication with the oral outlet of the oro-nasal interface,

wherein rotation of an impeller of the blower in a first direction of rotation generates a flow of gases to the nasal outlet, and rotation of the impeller in a second direction of rotation generates a flow of gases to the oral outlet.

26. A respiratory system as claimed in claim 25, comprising a controller configured to control the direction of rotation of the impeller based on at least one of a user input, a measured condition, or a predetermined condition.

27. A respiratory system as claimed in any one of the preceding claims, wherein the blower is a centrifugal blower.