The claims:

1. A voice generation system comprising:

a housing comprising a first opening and a second opening, the housing defining an air passage between the first opening and the second opening;

a moveable member located within the housing and configured to vibrate in response to air flowing in the air passage;

a transducer module configured to convert vibrations of the moveable member into an electrical signal; and

a speaker module configured to convert the electrical signal into sound and to output sound into the oral cavity of a user;

wherein, the voice generation system is configured such that during use, the air pressure at or near the second opening corresponds to an air pressure in the oral cavity of the user.

~~2. The voice generation system of claim 1, wherein the air flowing in the air passage is due to an air pressure difference between the first opening and the second opening.~~

~~3. The voice generation system of claim 1 or 2, wherein the air pressure at or near the first opening corresponds to an air pressure at the neck of the user.~~

2~~4~~. The voice generation system of claim 1~~3~~, wherein:

the second opening is configured to be in communication with the oral cavity of the user such that in use the air pressure at or near the second opening corresponds to an air pressure in the oral cavity of the user;

and/or

the air pressure at or near the first opening corresponds to an air pressure at the neck stoma of the user~~.~~

~~5. The voice generation system of any previous claim~~, optionally wherein the first opening is configured to be in communication with a neck stoma of the user such that the air pressure at the first opening corresponds to the air pressure at the neck stoma of the user.

~~6. The voice generation system of any previous claim, wherein the second opening is configured to be in communication with the oral cavity of the user such that the air pressure at the second opening corresponds to the air pressure at the oral cavity of the user.~~

~~7. The voice generation system of any previous claim, further comprising a tube having a first end connected to the housing around the second opening, wherein a second end of the tube is configured to be inserted into the oral cavity of the user.~~

~~8. The voice generation system of claim 7, wherein the housing and the tube together define an air passage between the first opening of the housing and the second end of the tube.~~

~~9. The voice generation system of any previous claim, wherein the speaker module is located within the housing, and wherein the speaker module is configured to output the sound through the second opening.~~

3~~10~~. The voice generation system of claim 1 or 2~~any previous claim~~, wherein the housing is configured to connect to an airflow source, the airflow source being configured to generate an airflow and to output the airflow into the oral cavity of the user.

4~~11~~. The voice generation system of claim 3~~10~~, wherein the airflow source is a neck stoma of the user and the airflow is a respiratory airflow outputted from the user through the neck stoma.

5. The voice generation system of any previous claim, wherein the housing is configured to attach to the neck or around the neck of a user such that the first opening is in communication with the neck stoma.

6~~12~~. The voice generation system of claim 3 or 4~~10~~, wherein the airflow source is an air pump.

7~~13~~. The voice generation system of claim 1, further comprising:

a pressure sensing module configured to attach to the neck of the user and to sense an air pressure at a neck stoma of the user;

an air pump located within the housing and configured to generate an airflow that moves along the air passage from the first opening to the second opening; and

a controller configured to control the air pump based on the sensed air pressure at the neck stoma

wherein the air pump is configured to generate an air pressure in the air passage corresponding to the sensed air pressure at the neck stoma; and

wherein in the air pump is in communication with and drives the moveable member vibration.

~~14. The voice generation system of claim 13, wherein the air flowing in the air passage is due to a difference in the air pressure in the air passage and the air pressure at the second opening.~~

~~15. The voice generation system of claim 13 or 14, wherein the second opening is configured to be in communication with the oral cavity of the user.~~

~~16. The voice generation system of any one of claims 13 to 15, further comprising a tube having a first end connected to the housing around the second opening, wherein a second end of the tube is configured to be inserted into the oral cavity of the user.~~

~~17. The voice generation system of claim 16, wherein the housing and the tube together define an air passage between the first opening of the housing and the second end of the tube.~~

8~~18~~. The voice generation system of claim 7~~any one of claims 13 to 17~~, wherein the speaker module is located within the housing, and wherein the speaker module is configured to output the sound through the second opening.

~~19. The voice generation system of any one of claims 13 to 18, wherein the air pump is configured to generate an air pressure in the air passage corresponding to the sensed air pressure at the neck stoma.~~

9. A voice generation system comprising:

a first pressure sensing module configured to attach to the neck of the user and to sense an air pressure at a neck stoma of the user;

a second pressure sensing module configured to sense an air pressure at or close to the oral cavity of the user;

a housing comprising a first opening and a second opening, the housing defining an air passage between the first opening and the second opening.

an air pump located within the housing and configured to generate an airflow that moves along the air passage from the first opening to the second opening; and

a controller configured to control the air pump based on the sensed air pressure at the neck stoma or the oral cavity or a combination of the two,

a moveable member located within the housing and configured to vibrate in response to air flowing in the air passage.

where in the air pump is in communication and drives a moveable member vibration

a transducer module configured to convert vibrations of the moveable member into an electrical signal; and

a speaker module configured to convert the electrical signal into sound and to output sound into the oral cavity of a user;

where the second opening is configured to be in communication with the oral cavity of the user.

~~20. The voice generation system of any one of claims 13 to 19, wherein the housing is configured to be secured to an auricle of the user.~~

~~21. The voice generation system of any previous claim, wherein the voice generation system is configured to be used hands free.~~

10~~22~~. A voice generation system comprising:

a housing comprising a first opening and a second opening, the housing defining an air passage between the first opening and the second opening, wherein the first opening is configured to be in communication with a neck stoma of the user;

a moveable member located within the housing and configured to vibrate in response to air flowing in the air passage;

a regulator located within the housing and configured to control a flow of air in the air passage;

a transducer module configured to convert vibrations of the moveable member into an electrical signal;

a speaker module configured to convert the electrical signal generated by the transducer module into sound and to output sound into the oral cavity of a user;

an air pump configured to generate an airflow into the oral cavity of the user;

a pressure sensing module configured to sense an air pressure in the oral cavity of the user; and

a controller configured to control the regulator based on the sensed air pressure in the oral cavity.

~~23. The voice generation system of claim 22, wherein the housing is configured to attach to the neck of a user such that the first opening is in connection with the neck stoma.~~

~~24. The voice generation system of claim 22, wherein the housing is fixed to a neck harness configured to fit around the rear neck of the user.~~

~~25. The voice generation system of any one of claims 22 to 24, further comprising:~~

~~a flow sensing module located within the housing and configured to sense an airflow in the air passage; and~~

~~a second controller configured to control the air pump based on the sensed airflow in the air passage;~~

~~wherein the air pump is configured to generate an airflow into the oral cavity corresponding to the sensed airflow in the air passage.~~

11~~29~~. The voice generation system of claim 10~~any one of claims 22 to 28~~, wherein the regulator is a further air pump that is configured to generate an air pressure in the air passage corresponding to the sensed air pressure in the oral cavity.

12~~26~~. The voice generation system of claim 9 or 11~~any one of claims 22 to 25~~, wherein the air pump and the moveable member~~speaker module~~ are located within a second housing which is configured to be secured to an auricle of the user, wherein the second housing comprises an opening configured to be in communication with the oral cavity of the user~~, and wherein the speaker module is configured to output the sound through the opening of the second housing~~.

1327. The voice generation system of claim 1226, further comprising a tube having a first end connected to the opening of the second housing, wherein a second end of the tube is configured to be inserted into the oral cavity of the user, and wherein the pressure sensing module is fixed to the second end of the tube.

1428. The voice generation system of any one of claims 9 to 1322 to 25, wherein the air pump, the speaker module, and the pressure sensing module are fixed to a denture unit configured to be secured to the oral cavity of the user.

~~29. The voice generation system of any one of claims 22 to 28, wherein the regulator is a further air pump that is configured to generate an air pressure in the air passage corresponding to the sensed air pressure in the oral cavity.~~

~~30. The voice generation system of any one of claims 22 to 28, wherein the regulator is an air valve configured to control the flow of air through the second opening.~~

~~31. The voice generation system of any previous claim, wherein the pressure sensing module is in wireless communication with the controller, and wherein the transducer module is in wireless communication with the speaker module.~~

1532. The voice generation system of any previous claim, further comprising a processing system~~.~~

~~33. The voice generation system of claim 32~~, wherein the processing system is configured to reduce sound interference received at the transducer module.

1634. The voice generation system of claim 1633, wherein the processing system is configured to reduce sound interference based on at least one electrical signal received from:

- the transducer module configured to convert vibrations of the moveable member, and/or
- at least one interference transducer module for receiving sound interference

1735. The voice generation system of claim 1633 or 1734, wherein the sound interference at the transducer module comprises sound outputted by the speaker module, and/or speech that is generated when sound outputted by the speaker module is modulated by movement of the user's mouth.

18. The voice generation system of any previous claim, wherein the voice generation system is configured to be used hands free.

~~36. A voice generation system comprising:~~

~~a housing comprising a first opening and a second opening, the housing defining an air passage between the first opening and the second opening;~~

~~a moveable member located within the housing and configured to vibrate in response to air flowing in the air passage;~~

~~a transducer module configured to convert vibrations of the moveable member into an electrical signal;~~

~~a speaker module configured to convert the electrical signal into sound and to output sound into the oral cavity of a user; and~~

~~a processing system configured to reduce sound interference received at the transducer module.~~

~~37. The voice generation system according to claim 36, wherein the processing system is configured to reduce sound interference based on at least one electrical signal received from:~~

- ~~the transducer module configured to convert vibrations of the moveable member, and/or~~
- ~~at least one interference transducer module for receiving sound interference~~

~~38. The voice generation system according to claim 36 or 37, wherein the processing system is configured to reduce sound interference by performing feedforward suppression.~~

~~39. The voice generation system according to claim 38, wherein feedforward suppression comprises one or more of: gain reduction, frequency selective noise reduction, notch filter, phase modulation, and frequency shifting.~~

~~40. The voice generation system according to any one of claims 36 to 39, wherein the processing system is configured to reduce sound interference by performing adaptive feedback cancellation or residual feedback suppression.~~

~~41. The voice generation system according to claim 40, wherein adaptive feedback cancellation comprises adaptive filtering.~~

~~42. The voice generation system according to claim 41, wherein adaptive filtering is done with an FIR filter.~~

~~43. The voice generation system according to claim 41 or 42, wherein adaptive filtering is done using a (real-time) normalized least-mean-square (NLMS) algorithm.~~

~~44. The voice generation system according to any one of claims 36 to 43, further comprising at least one interference transducer module for receiving sound interference.~~

~~45. The voice generation system according to any one of claims 36 to 44, wherein the sound interference at the transducer module comprises sound outputted by the speaker module, and/or speech that is generated when sound outputted by the speaker module is modulated by movement of the user's mouth.~~

~~46. The voice generation system according to claim 45, further comprising a first interference transducer module configured to convert sound outputted by the speaker module into an electrical signal as an input for the processing system.~~

~~47. The voice generation system according to claim 46, further comprising a second interference transducer module configured to convert speech that is generated when sound outputted by the speaker module is modulated by movement of the user's mouth into an electrical signal as an input for the processing system.~~

~~48. The voice generation system according to any one of claims 36 to 47, wherein the processing system outputs at least one electrical signal to reduce sound interference.~~

~~49. The voice generation system of any one of claims 36 to 48, wherein the interference transducer module comprises any one of:~~

- ~~a microphone~~
- ~~a piezoelectric transducer~~
- ~~a magnetic pickup transducer,~~
- ~~an accelerometer~~
- ~~a voice sensor~~
- ~~a vibration sensor~~

~~50. The voice generation system of any previous claim, wherein the processing system is configured to process the electrical signal generated by the transducer module.~~

~~51. The voice generation system of claim 50, wherein the processing system comprises hardware and software configured to improve a volume or quality of a voice encoded by the electrical signal.~~

~~52. The voice generation system of claim 51, wherein the processing system comprises an AI voice conversion software to improve the quality of the voice encoded by the electrical signal.~~

~~53. The voice generation system of any previous claim, wherein the transducer module comprises a microphone.~~

~~54. The voice generation system of any previous claim, wherein the transducer module comprises a piezoelectric transducer.~~

~~55. The voice generation system of any previous claim, wherein the transducer module comprises a magnetic pickup transducer.~~

~~56. The voice generation system of any previous claim, wherein the speaker module comprises a loudspeaker array.~~

~~57. The voice generation system of any previous claim, wherein the transducer module comprises any one of:~~

- ~~a pressure sensor~~
- ~~a sound sensor~~
- ~~a vibration detection sensor~~
- ~~an accelerometer~~

~~58. The voice generation system of any previous claim, wherein the moveable member comprises a membrane.~~

~~59. The voice generation system of any previous claim, wherein the moveable member comprises multiple membranes with different levels of complexity.~~

~~60. A voice generation system comprising:~~

~~a housing comprising a first opening and a second opening, the housing defining an air passage between the first opening and the second opening;~~

~~a moveable member located within the housing and configured to vibrate in response to air flowing in the air passage;~~

~~a transducer module configured to convert vibrations of the moveable member into an electrical signal; and~~

~~a speaker module configured to convert the electrical signal into sound and to output sound into the oral cavity of a user;~~

~~wherein, output sound is based on air pressure in the oral cavity of the user.~~

~~61. A voice generation system of claim 60, wherein the voice generation system is configured such that during use, the air pressure at or near the second opening corresponds to an air pressure in the oral cavity of the user.~~

19~~62~~. A method of generating a voice, comprising:

providing a moveable member in communication with an airflow corresponding to a respiratory airflow of a user, the moveable member provided in an air channel being subjected to a first air pressure at a first end of the air channel and a second air pressure at a second end of the air channel;

detecting vibrations of the moveable member in response to the airflow;

generating, using one or more electrical speakers, a sound derived from the detected vibrations; and

supplying an airflow and the sound into the oral cavity of the user,

wherein the second air pressure corresponds to an air pressure in the oral cavity of the user.

~~63. The method of claim 62, wherein the moveable member is provided in an air channel, the air channel being subject to a first air pressure at a first end of the air channel and a second air pressure at a second end of the air channel.~~

~~64. The method of claim 62 or 63, wherein the second air pressure corresponds to an air pressure in the oral cavity of the user.~~

~~65. The method of claim 62 or 63, wherein the first air pressure corresponds to an air pressure of a neck stoma of the user.~~

~~66. The method of claim 65, further comprising:~~

~~sensing the air pressure and/or an airflow at the neck stoma of the user; and~~

~~generating, using an air pump, the first air pressure and the airflow of the neck stoma.~~

~~67. The method of claim 65, further comprising:~~

~~sensing the air pressure in the oral cavity of the user; and~~

~~generating, using an airflow control element, the second air pressure.~~

~~68. The method of claim 67, wherein the airflow control element is an air pump.~~

~~69. The method of claim 67, wherein the airflow control element is an air valve.~~

~~70. The method of claim 67, wherein the airflow control element is any one of:~~

- ~~a suction~~
- ~~an actuator~~

~~71. The method of any one of claims 67 to 69, further comprising channelling, within an air passage, a respiratory airflow of the user, wherein the airflow is the channelled respiratory airflow.~~

20~~72~~. The method of claim 19~~any one of claims 62 to 71~~, further comprising:

converting, using a transducer, the vibrations of the moveable member into an electrical signal;

processing the electrical signal; and

supplying the processed electrical signal to the one or more electrical speakers for generating the sound.

~~73. The method of claim 72, wherein processing the electrical signal comprises improving a volume or quality of a voice encoded by the electrical signal.~~

~~74. The method of any one of claims 62 to 73, further comprising reducing sound interference generated by the one or more electrical speakers.~~