Claims

1. An apparatus for improving breath quality during sleep, characterized in that the apparatus comprises:

a negative pressure source;

an oral interface being placed within the oral cavity of a user in order to provide a fluid passage in the oral cavity of the user;

a reservoir for collecting saliva of the user;

a communicating tube having a first open end portion and a second open end portion, wherein the first open end portion is communicated to the oral interface, and the second open end portion is communicated with the reservoir and the negative pressure source in order to create a negative pressure path between the oral cavity of the user and the negative pressure source; and

a fluid adjuster having a first connecting end and a second connecting end, the fluid adjuster being used to restrict all fluids to flow to the second connecting end, the first connecting end being communicated to the fluid passage of the oral interface, and characterized in that the fluid adjuster comprises a tri-way connector, a first one-way valve, and a second one-way valve, the tri-way connector having the first connecting end, the second connecting end, and a third connecting end, the first one-way valve being disposed at the first connecting end to restrict the fluid to flowing to the second connecting end, and the second one-way valve being disposed at the third connecting end to restrict the ambient air to flowing into the communicating tube from the second one-way valve and the second connecting end, contributing to having the saliva staying in the communicating tube flow to the reservoir.

2. The apparatus of Claim 1, characterized in that the fluid adjuster comprises a tri-way connector, a first one-way valve, a second one-way valve, and a vacuum

actuated pressure relief valve, the tri-way connector having the first connecting end, the second connecting end, and a third connecting end, the first one-way valve being disposed at the first connecting end to restrict the fluid to flowing to the second connecting end, the second one-way valve being disposed at the third connecting end, and the vacuum actuated pressure relief valve being combined with the second one-way valve to turn on the vacuum actuated pressure relief valve to let in the ambient air at a predetermined negative pressure value, and to restrict the ambient air to flowing from the second one-way valve and the second connecting end to the communicating tube to contribute to having the saliva staying in the communicating tube flow to the reservoir

3. The apparatus of Claim 2, characterized in that the vacuum actuated pressure relief valve includes a main body, a propelling valve, a spring, and a spring seat, wherein a spacer having a passage is disposed inside the main body to section the main body area into a first chamber and a second chamber, the first chamber is communicated with the ambient air, the second chamber is communicated with the second one-way valve, and the propelling valve is movably arranged in the first chamber and go through the passage, the space of the passage is completely occupied by the propelling valve to allow the fluid in the first chamber to be isolated from the second chamber under the condition that the vacuum actuated pressure relief valve is not activated; the spring seat is arranged on a surface of the spacer in the first chamber, and the spring rests between the propelling valve and the spring seat.

4. The apparatus of Claim 1, characterized in that the reservoir is communicated to the second open end portion of the communicating tube, and the negative pressure source is communicated to the reservoir.

5. The apparatus of Claim 1, characterized in that the negative pressure source is communicated to the second open end portion of the communicating tube, and the reservoir is communicated to the negative pressure source.

6. The apparatus of Claim 4 or 5, characterized in that the apparatus further includes:

a control unit;

a timer, which is started to time/stop timing by the control unit; and

a pressure sensor for measuring the pressure inside the reservoir and transmitting a measured pressure value to the control unit;

wherein after the timer is started to time to a set time interval and sends out a notifying signal to the control unit, the control unit is then notified to read the pressure value transmitted by the pressure sensor.

7. The apparatus of Claim 6, characterized in that the control unit has a built-in correspondence table showing the pressure-liquid capacity in the reservoir corresponding to the set time interval timed by the timer, to determine the liquid capacity inside the reservoir according to the pressure value and the correspondence table of the pressure-liquid capacity in the reservoir.

8. The apparatus of Claim 1, characterized in that the oral interface further includes:

a flexible shield being positioned between a user’s lips and teeth;

an extending part being formed at one side of the flexible shield and protruding outside the oral cavity of the user; and

a flexible fluid tube passing through the flexible shield and the extending part, the flexible fluid tube having a first open end portion and an opposite second open end portion, the first open end portion extending and protruding outside the oral cavity of

the user and being communicated with a negative pressure source, the second open end portion being positioned between the user's tongue and upper palate.

9. The oral interface of Claim 8, characterized in that the flexible shield having at least a one-way valve used to restrict the air in the oral cavity of the user to flow from the one-way valve out of the oral cavity.

10. The oral interface of Claim 9, characterized in that the flexible fluid tube has at least one through-hole being positioned nearby the flexible shield, the through-hole being communicated with one side of the fluid tube and used to be communicated with the front region inside the oral cavity of the user.