What is claimed is:

1. A mouthpiece for providing non-invasive neuromodulation to a patient, the mouthpiece comprising:

an elongated housing having an anterior region and a posterior region, the elongated housing having a non-planar exterior top surface, the anterior region and the posterior region having approximately equal densities with the posterior region having a greater volume than the anterior region such that the product of the density of the posterior region and the volume of the posterior region is greater than the product of the density of the anterior region and the volume of the anterior region, causing a center of gravity to be located within the posterior region;

a positioning pad attached to the top surface of the housing for minimizing contact between a patient's upper teeth and the exterior top surface of the elongated housing; and

a printed circuit board mounted to a bottom portion of the elongated housing, the printed circuit board having a plurality of electrodes for delivering subcutaneous local electrical stimulation to the patient's tongue.

2. The mouthpiece of claim 1 further comprising an elongated housing with a posterior region having an average width greater than an anterior region of the elongated housing.

3. The mouthpiece of claim 1 further comprising an elongated housing with a posterior region having an average height greater than an anterior region of the elongated housing.

4. The mouthpiece of claim 1 further comprising an elongated housing with an anterior region having a length greater than a posterior region of the elongated housing.

5. The mouthpiece of claim 1 further comprising an elongated housing having an average length greater than an average width and an average height.

6. The mouthpiece of claim 5 further comprising an elongated housing having an average

width greater than an average height.

7. The mouthpiece of claim 1 further comprising an elongated housing with a posterior region having a first average width and with an anterior region having a second average width, the elongated housing having a horizontal transition region connecting the anterior region to the posterior region, the horizontal transition region having a width that varies smoothly between the first width and the second width.

8. The mouthpiece of claim 7 wherein the width of the horizontal transition region varies linearly between the first width and the second width.

9. The mouthpiece of claim 7 wherein the width of the horizontal transition region has a concave profile.

10. The mouthpiece of claim 1 further comprising an elongated housing with a posterior region having a first average height and with an anterior region having a second average height, the elongated housing having a vertical transition region connecting the anterior region to the posterior region, the vertical transition region having a height that varies smoothly between the first average height and the second average height.

11. The mouthpiece of claim 10 wherein the height of the vertical transition region varies linearly between the first height and the second height.

12. The mouthpiece of claim 1 wherein the posterior region has a convex shape.

13. The mouthpiece of claim 1 further comprising:

an elongated housing with a posterior region having a first average width and with an anterior region having a second average width, the elongated housing having a horizontal transition region connecting the anterior region to the posterior region, the horizontal transition region having a width that varies linearly between the first average width and the second average width; and an

elongated housing with a posterior region having a first average height and with an anterior region having a second average height, the elongated housing having a vertical transition region connecting the anterior region to the posterior region, the vertical transition region having a height that varies smoothly between the first average height and the second average height.

14. The mouthpiece of claim 1 wherein the anterior region of the elongated housing includes a first plateau having a first height surrounded by a second plateau having a second height.

15. The mouthpiece of claim 14 wherein the first height is greater than the second height.

16. The mouthpiece of claim 1 wherein the anterior region of the elongated housing includes a first plateau having a first height surrounded by a second plateau having a second height.

17. The mouthpiece of claim 16 wherein the first plateau has an ovular shape.

18. The mouthpiece of claim 17 wherein the second height is smaller than the first height.

19. The mouthpiece of claim 1 wherein the posterior region of the elongated housing includes a rectangular shaped plateau.

20. The mouthpiece of claim 1 further comprising an elongated housing with a posterior region having a maximum width greater than an anterior region of the elongated housing.

21. The mouthpiece of claim 1 further comprising an elongated housing with a posterior region having a maximum height greater than an anterior region of the elongated housing.

22. The mouthpiece of claim 1 further comprising an elongated housing with a posterior region having a minimum width greater than a maximum width of an anterior region of the elongated housing.

23. The mouthpiece of claim 1 further comprising an elongated housing with a posterior region having a minimum height greater than a maximum height of an anterior region of the elongated housing.

24. The mouthpiece of claim 1 further comprising an elongated housing having a posterior region with a greater mass than an anterior region.

25. The mouthpiece of claim 1 wherein a portion of the anterior region is removed to cause the anterior region to have a smaller mass than the posterior region.

26. The mouthpiece of claim 1 wherein a mass is added to the posterior region to cause the posterior region to have a larger mass than the anterior region.

27. A mouthpiece for providing non-invasive neuromodulation to a patient, the mouthpiece comprising:

an elongated housing having an anterior region and a posterior region, the elongated housing having a non-planar exterior top surface, the anterior region having a greater density than the posterior region with the posterior region having a greater volume than the anterior region such that the product of the density of the posterior region and the volume of the posterior region is greater than the product of the density of the anterior region and the volume of the anterior region, causing a center of gravity to be located within the posterior region;

a positioning pad attached to the top surface of the housing for minimizing contact between a patient's upper teeth and the exterior top surface of the elongated housing; and

a printed circuit board mounted to a bottom portion of the elongated housing, the printed circuit board having a plurality of electrodes for delivering subcutaneous local electrical stimulation to the patient's tongue.

28. The mouthpiece of claim 27 further comprising an elongated housing having a posterior region with a greater mass than an anterior region.

29. The mouthpiece of claim 27 wherein a portion of the anterior region is removed to cause

the anterior region to have a smaller mass than the posterior region.

30. The mouthpiece of claim 27 wherein a mass is added to the posterior region to cause the posterior region to have a larger mass than the anterior region.

31. A mouthpiece for providing non-invasive neuromodulation to a patient, the mouthpiece comprising:

an elongated housing having an anterior region and a posterior region, the elongated housing having a non-planar exterior top surface, the posterior region having a greater density than the anterior region with the posterior region having a greater volume than the anterior region such that the product of the density of the posterior region and the volume of the posterior region is greater than the product of the density of the anterior region and the volume of the anterior region, causing a center of gravity to be located within the posterior region; and

a printed circuit board mounted to a bottom portion of the elongated housing, the printed circuit board having a plurality of electrodes for delivering subcutaneous local electrical stimulation to the patient's tongue.