

1978. .

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Claims

I claim:

1. Apparatus for creating human hearing comprising:

(a) an audio source for creating electrical audio waves having positive peaks;

(b) a frequency modulator generator connected to the audio source to create frequency modulated bursts;

(c) a source of constant voltage to create a voltage standard that is in the range of 25% to 85% of the peak voltage of the audio waves;

(d) a comparator connected to the voltage source and the audio source to compare the instantaneous voltage of the waves from the audio source with the voltage standard;

(e) a connection of the comparator to the frequency modulator generator to activate the frequency modulator generator when the instantaneous voltage of the audio wave exceeds the standard voltage;

(f) a microwave generator creating microwaves in the range of 100 megahertz to 10,000 megahertz and connected to the frequency modulator generator, generating microwaves only when pulsed by the frequency modulator generator; and

(g) an antenna connected to the microwave generator to radiate the head of a human being to produce the sounds of the audio source.

2. Apparatus as set forth in claim 1 wherein the frequency generating range of the frequency modulator generator is 1 KHz to 100 KHz for bursts and 100 KHz to 20 MHz for pulses within a burst.

3. Apparatus as set forth in claim 1 wherein the frequency generating range of the frequency modulator generator is one KHz to 100 KHz for bursts and 100 KHz to 20 MHz for pulses within a burst and the duration of each pulse of the frequency modulator generator is in the range of 10 nanoseconds to 1 microsecond.

4. Apparatus as set forth in claim 1 wherein the voltage standard is approximately 50% of the peak of the audio waves.

5. Apparatus as set forth in claim 1 wherein the antenna is of the type that projects the microwaves in space to the head of a person.

bursts.

The microwave generator 19 operates at a steady frequency presently preferred at 1,000 megahertz (1,000 million). I presently prefer to pulse the microwave energy at pulse widths of 10 nanoseconds to 1 microsecond. For any one setting of the FM capable generator 12, this width is fixed. The pulses are arranged in bursts. The timing between bursts is controlled by the height of the audio envelope above the voltage standard line. In addition the bursts are spaced from one another at a non-uniform rate of 1 to 100 KHz. This non-uniform spacing of bursts is created in the FM capable generator 12.

Referring to FIG. 2 there is illustrated an audio wave 27 generated by the audio input 10 wherein the horizontal axis is time and the vertical axis is voltage. For illustrative purposes the wave 27 is shown as having a voltage peak 28 on the left part of FIG. 2 and a voltage peak 29 of the right side of FIG. 2. The voltage standard 16 of FIG. 1 generates a dc voltage designated at 31 in FIG. 2. This standard voltage is preferably at about 50% of the peak voltage 28. The comparator 14 of FIG. 1 actuates the FM capable generator 12 only when the positive envelope of the audio wave 27 exceeds the voltage standard. The negative portions of the audio wave are not utilized.

Referring now to FIG. 3 there is illustrated two groups of bursts of microwave energy that are delivered by the antenna 22 of FIG. 1 to the head of the person 23. FIG. 3 has a horizontal time axis identical to the time axis of FIG. 2 and has a vertical axis that in this case represents the power of the microwaves from generator 19. At the left part of FIG. 3 are a plurality of microwave bursts 32 that occur on the time axis from the point of intersection of the standard voltage 31 with the positive part of the audio wave 27, designated as the time point 33 to time point 34 on FIG. 2. It will be noted in FIG. 3 that the bursts 32 are non-uniform in spacing and that they are closer together at the time of maximum audio voltage 28 and are more spread out toward the time points 33 and 34. This is the frequency modulation effected by the FM pulse generator 12.

Referring to the right part of FIG. 3 there are a plurality of microwave bursts 36 that are fewer in number and over a shorter time period than the pulses 32. These extend on the time axis of FIG. 2 from point 37 to point 38. These bursts 36 are also frequency modulated with the closest groupings appearing opposite peak 29 of FIG. 2 and greater spacing near time points 37 and 38.

Referring now to FIG. 4 there is illustrated the fact that a single burst shown as straight lines 32 or 36 on FIG. 3 are made up of ten to twenty separate microwave pulses. The duration of the burst is between 500 nanoseconds and 100 microseconds, with an optimum of 2 microseconds. The duration of each pulse within the burst is 10 nanoseconds to 1 microsecond and a time duration of 100 nanoseconds is preferred. The bursts 32 of FIG. 3 are spaced non-uniformly from each other caused by the frequency modulation of 12. FIG. 4 depicts a burst. Each vertical line 40 in FIG. 4 represents a single pulse. Each pulse is represented by the envelope 41 of FIG. 5. The pulses within a burst are spaced uniformly from each other. The spacing between pulses may vary from 5 nanoseconds to 10 microseconds.

Referring now to FIG. 3, the concentration of bursts 32 opposite the peak 28 of FIG. 2 can be expressed as a frequency of repetition. I presently prefer to adjust the FM capable generator 12 to have a maximum frequency of repetition in the range of 25 KHz to 100 KHz. I deliberately keep this range low to reduce the amount of heating caused by the microwaves. The wider spacing of the pulses 32 opposite the cutoff points 33 and 34 of FIG. 2 can also be expressed as a frequency of repetition and I presently prefer a minimum repetition rate of 1 KHz. I find that this low repetition rate, although in the audio range, does not disrupt the transmission of audio intelligence to the person 23. The aim, again, is to reduce the amount of heat transmitted to the subject 23.

I have not been able to experiment to determine how my microwave system works, but from my interpretation of prior work done in this field I believe that the process is as follows. Any group of bursts related to the audio ek 28 of FIG. 2 causes an increasing ultrasonic build up within the head of a human being starting with a low level for the first bursts pulses and building up to a high level with the last bursts pulses of a group. This buildup, I believe, causes the direct discharge of random brain neurons. These discharges at audio frequency create a perception of sound. This process, I believe, bypasses the normal hearing organs and can create sound in a person who is nerve-dead deaf. However, this theory of operation is only my guess and may prove to be in error in the future.

APPARATUS

The apparatus of FIG. 1 for carrying out my invention may include as a microwave generator Model PH40K of Applied Microwave Laboratories and described as Signal Source. The cable 21 connecting the microwave generator 19 and the antenna is RG8 coaxial cable by Belden Industries. The antenna 22 may be a standard parabolic antenna. The FM generator 12 has to be specially built to include the spacing runction which is obtained by a frequency generator built into a standard FM generator.

I have described my invention with respect to a presently preferred embodiment as required by the patent statutes. It will be apparent to those skilled in the technology that many variations, modification and additions can be made. All such variations, modifications and additions that come within the true spirit and scope of the invention are included in the claims.

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