CLAIMS

1. A hearing aid having a signal processor comprising:

___means for splitting an input signal into a first frequency band and a second frequency band,

___a first frequency detector capable of detecting a first characteristic frequency in the first frequency band,

___a second frequency detector capable of detecting a second characteristic frequency in the second frequency band,

___~~means for shifting the signal of the first frequency band a distance in frequency in order to form a signal falling within the frequency range of the second frequency band,~~ at least one oscillator controlled by the first and second frequency detectors,

___means for ~~multiplying~~ shifting the signal from the first frequency band by multiplying said signal with the output signal from the oscillator for creating ~~the~~ a frequency-shifted signal falling within the second frequency band,

___means for superimposing the frequency-shifted signal onto the second frequency band, and

___means for presenting the combined signal of the frequency-shifted signal and the second frequency band to an output transducer,

characterized in

~~the~~ means for determining the presence of a fixed relationship between the first characteristic frequency and the second characteristic frequency in order to verify that the first characteristic frequency and the second characteristic frequency are both harmonics of the same fundamental frequency, and

___said means for shifting the signal of the first frequency band being controlled by the means for determining the fixed relationship between the first frequency and the second frequency.

2. The hearing aid according to claim 1, wherein the means for detecting a first frequency in the input signal is a first notch filter having a first notch gradient, and the means for detecting a second frequency in the input signal is a second notch filter having a second notch gradient.

3. The hearing aid according to claim 1, wherein the means for determining the presence of a fixed relationship between the first frequency and the second frequency in the input signal comprises means for generating a combined gradient by combining the first and the second notch gradient.

4. The hearing aid according to claim 3, wherein the means for shifting the signal of the first frequency band to the second frequency band is controlled by the means for generating a combined gradient.

5. The hearing aid according to claim 1, comprising means for detecting the presence of a voiced-speech signal and means for detecting an unvoiced-speech signal in the input signal.

6. The hearing aid according to claim 5, wherein the means for detecting the presence of a voiced speech signal comprises means for disabling frequency shifting of the voiced speech signal.

7. The hearing aid according to claim 5, wherein the means for detecting the presence of an unvoiced speech signal comprises means for enabling frequency shifting of the unvoiced speech signal.

8. The hearing aid according to claim 5, wherein the means for detecting a voiced speech signal comprises an envelope filter for extracting an envelope signal from the input signal.

9. The hearing aid according to claim 5, wherein the means for detecting unvoiced speech signal comprises a zero-crossing rate counter and an averaging zero-crossing rate counter for detecting an unvoiced speech level in the envelope signal.

10. A method of shifting audio frequencies in a hearing aid, said method involving the steps of:

___-obtaining an input signal,

___detecting a first dominating frequency in the input signal,

___detecting a second dominating frequency in the input signal,

___shifting a first frequency range of the input signal to a second frequency range of the input signal,

___superimposing the frequency-shifted first frequency range of the input signal to the second frequency range of the input signal according to a set of parameters derived from the input signal,

___characterized in

~~wherein the step of detecting the first dominating frequency and the second dominating frequency incorporates the step of~~ determining the presence of a fixed relationship between the first dominating frequency and the second dominating frequency in order to verify that the first dominating frequency and the second dominating frequency are both harmonics of the same fundamental frequency, and,

~~the step of~~ shifting the first frequency range being controlled by the fixed relationship between the first dominating frequency and the second dominating frequency.

11. The method according to claim 10, wherein the step of detecting a first dominating frequency and a second dominating frequency in the input signal involves deriving a first notch gradient and a second notch gradient from the input signal.

12. The method according to claim 11, wherein the step of determining the presence of a fixed relationship between the first dominating frequency and the second dominating frequency in the input signal involves combining the first notch gradient and the second notch gradient into a combined gradient

and using the combined gradient for shifting the first frequency range of the input signal to the second frequency range of the input signal.

13. The method according to claim 10, wherein the step of superimposing the frequency-shifted first frequency range onto the second frequency range uses the presence of the fixed relationship between the first dominating frequency and the second dominating frequency as a parameter for determining the output level of the frequency-shifted first frequency range.

14. The method according to claim 11, wherein the step of detecting the first dominating frequency and the second dominating frequency involves the steps of detecting the presence of a voiced-speech signal and an unvoiced-speech signal, respectively, in the input signal, enhancing frequency shifting of the unvoiced-speech signal and suppressing frequency shifting of the voiced-speech signal.